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HE FACTS OF LIFE

ROM BIRTH TO DEATH

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In Collaboration with
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To
CHARLES G. TAYLOR, JR
President
Metropolitan Life Insurance Company

AS A TOKEN OF AFFECTION AND RESPECT

PREFACE

A lifetime in the field of human biology, over forty years of which have been in the service of life insurance, has brought rich opportunities to observe and study a wide range of facts relating to man's health and welfare. It has been my good fortune during this long period to direct a staff of skilled workers with whose help a wealth of data has been compiled and analyzed. A large life insurance company like the Metropolitan, which is intimately concerned with the well-being of its policyholders and the communities in which they live, has use for such information in the conduct of its business. It has, moreover, as a public service, made such data generally available. The modes of dissemination have been many. Several hundred articles have been published in both the scientific and popular press. Many addresses have been made before scientific societies, and a number of books have been written that have brought together special areas of knowledge. A popular summary of our current studies is presented in our monthly *Statistical Bulletin,* now in its thirty-second year.

Our publications have been favored with a wide circle of readers representing both the general public and the technical world. Over the years we have received a great number of inquiries from individuals, business and industry, and various public agencies. There is a perennial interest in the facts that touch human life closely. The questions have been on such a variety of topics as population, birth, marriage, health, longevity, and the factors influencing them. This volume has been suggested by this far-flung correspondence. Many of the questions are taken directly from our files. It is hoped that this compilation of questions and answers will meet the needs of the large number who seek information on the topics covered.

The question-and-answer technique adopted here has the obvious advantage of quick and ready reference for the occasional inquirer. The detailed and comprehensive index will facilitate finding the answers to specific queries. At the same time, the requirements of those who may wish a more rounded exposition of the main topics have not been overlooked. The questions and answers for each chapter have been so selected and arranged as to cover the ground fairly broadly. Those who read through a whole chapter should find themselves well informed on the main points, at least. For readers whose appetites are whetted to study further, a list of selected references is given at the end of the volume. The book, in short, should be of interest to those who read to satisfy their curiosity as well as for those professionally concerned with the health and welfare of the American people. It is hoped that physicians, health and social workers, teachers and students of sociology and biology will find the volume useful.

Obviously a book of this type cannot hope to embrace the entire field of human biology; it does attempt, however, to cover a broad range of topics of current general interest. In the nature of the case, too, it is not the product of one mind. It represents rather the coordinated effort of the staff of the Statistical Bureau of the Metropolitan Life Insurance Company. It is a pleasure to acknowledge my indebtedness to a group of devoted colleagues and particularly to Mr. Mortimer Spiegelman, my collaborator, Mr. Herbert Marks, Mr. Robert Vane, Mr. Henry Klein, Mr. Paul Jacobson, Miss Elizabeth Steele, and Mrs. Alice Beckwith. I acknowledge also my obligation to many friends and co-workers outside the office who have helped in reading and checking particular chapters. They are too many to name individually, but all of them have my heartfelt thanks.

Louis I. Dublin

October 1, 1951

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I

WHO WE ARE—THE POPULATION

1. What is the population of the world?

There are nearly 2,500,000,000 persons living in the world today. In the two centuries from about 1650 to 1850 the population had doubled; and in the last hundred years it has doubled again. It is very unlikely, however, that it will double a third time by the year 2000. In many regions, particularly North America and Northwestern Europe, the rate of population growth has fallen off materially.

2. What part of the world population lives in the United States?

About 6 percent of the people in the world live in the United States. This country had a population of more than 153,000,000 in January 1951, with another 3 million in our outlying territories and possessions. The United States is the fourth-ranking nation in the world with respect to population, being outclassed by China (about 460,000,000), India (about 345,000,000), and the U.S.S.R., which had 193,000,000 inhabitants in 1946.

Asia is by far the most populous continent; it is the home of more than half of the world's people. Europe has about 17 percent; North America, 9 percent; Africa, 8 percent; South America, nearly 5 percent; and Oceania, including Australia and New Zealand, one-half of 1 percent.

3. How fast is the United States growing?

The increase in the number of people in our country has been greater in recent years than in any comparable period of our history, but the rate of growth is much slower than a century ago. When the United States was a new country, the population grew with phenomenal speed, as much as 3.5 percent a year. Now, with the total more than 38 times as large as in the first census in 1790, the rate of increase is down to about 1.5 percent a year. During the depression years of the 1930's it averaged only about 0.7 percent per annum, a rate which, if continued, foreshadowed a stationary or even a declining population.

The decline in rate of growth has been due in part to the cut in immigration and to the long-term decline in the birth rate. With our present population, for immigration to assume the relative importance it had fifty years ago, it would have to reach one million a year, more than six times the total annual quota. The birth rate, which had fallen to the lowest point in our history during the 1930's, has risen sharply since World War II.

4. How big is our population likely to be in fifty years?

The number of births has already fallen somewhat from the record high of 3,876,000 in 1947, and the natural increase in population (excess of births over deaths), which varied between 2,000,000 and 2,500,000 in each year since World War II, will probably not be equaled for a long time. It is likely, however, that our population will pass 200 million well before the end of this century.

5. Has America's population grown faster than Europe's?

In the last 150 years the United States has grown at a more rapid rate than most countries of the world. The majority of nations in Northwestern and North Central Europe have been headed for a stationary or even a declining population. France, for example, from the middle of the nineteenth century has increased only from about 35 million to a total of 42 million inhabitants in 1949, at the same time that the American population rose more than 500 percent. During the five-year period from 1936 to 1940 the number of deaths in France exceeded the number of births by 1.5 per 1,000 population annually. Even in the southern countries, like Italy and Spain, population growth has slowed down.

6. What region of the world has the greatest prospect of population increase?

Asia has the potentialities for the largest increase in population. The countries in that area have the highest birth rates and death rates in the world; and if improved sanitary and health conditions bring reductions in mortality while fertility remains at a high level, the population will rise sharply. It is estimated that under such circumstances the population of India would be 750 million in 75 years, and that of China would reach about one billion in 50 years, double their present figures. This is not impossible since Japan, although not reproducing as close to her physiological maximum as is most of Asia, doubled her population in three-quarters of a century while industrializing and Westernizing the country and fighting at least three major wars.

7. What country has been losing population for a hundred years?

Ireland has been diminishing in numbers for a century. There were more than six and a half million inhabitants in Southern Ireland in 1840 and only three million in 1950. Poverty and food shortages forced large numbers of Irish to leave their homes, most of them coming to North America. Emigration accounted for part of the population decline, the fall in the birth rate contributing as well. Both these factors reflected difficult economic conditions.

8. Has the United States grown more from immigration or natural increase?

In all, about 39,400,000 immigrants have come into this country since 1820, but in no year have the net additions to population from immigration equaled those from births. Immigration played its largest role in the country's growth in the 1880's, when about two-fifths of the growth resulted from immigration.

Only in a limited sense can it be said that natural increase has been more important than immigration in a country where almost all the inhabitants have ancestors of foreign origin. Shortly after the Revolution, this country had already built up a population of close to four million (3,929,000 in 1790). Since then it has been able to absorb a large flow of immigrants who have contributed their share to the building of our country and who have left their imprint on our customs and idiom.

9. Is there a large foreign-born element in the United States today?

At present, only about 7 percent of the people of the United States were born in other countries. Within the last century the proportion of foreign-born in our population has never been higher than 15 percent. In other words, the native element of the U. S. population has never been less than 85 percent of the total. The number of foreign-born residents reached a peak of 14,204,149 in 1930, although their proportion had already dropped to 11.6 percent of the population. In the 1930's the number of foreign-born fell rapidly while the population as a whole increased. Today, out of a population of 153,000,000 only about 10,000,000 are foreign-born.

10. Is the foreign-born population older than the native population?

One reason why the foreign-born population is decreasing rapidly is that their age level is much higher than that of the general population. During the periods of peak immigration, the bulk of those who came in were adults. Because of the subsequent restrictions on immigration, the foreign-born today are largely the survivors of pre-World War I immigrants and are well along in years. In 1940, while 23.3 percent of the native whites were over 45 years of age, the comparable percentage for the foreign-born was 65.8.

11. From what countries have most immigrants come?

Though the United States is often considered an offspring of Great Britain, the fact is that for more than a century the majority of our immigrants have not come from Britain, but from the continent of Europe. Relatively few are from other American nations, from Asia, or from Africa.

According to the census of 1860, 39 percent of the foreign-born were from Ireland, 31 percent from Germany, 14 percent from Great Britain, and 7 percent from the Scandinavian and other Northwestern European countries. Since then, the whole center of immigration has moved toward Southern and Eastern Europe. At the time of the 1940 census, Italy was the leading country of origin of our foreign-born, followed, in order of numbers, by Russia, Germany, Canada, and

Newfoundland (largely of British, Irish, and French descent), Poland, Great Britain, Scandinavia, Ireland, and the countries of Central Europe.

12. What have been the chief restrictions on immigration?

Originally, the control of immigration was exercised by individual states. Since great differences in policy developed, in 1875 Congress took the power of regulation for the federal government by passing a law to exclude prostitutes and alien convicts. By now there is a long list of excluded classes, including those with various mental or physical defects or diseases, contract laborers, illiterates, and those undesirable for political reasons.

The quota system was not started until after World War I. Originally, the number allowed to come in was 358,000, but this figure was later reduced. Today the total is 154,206. The numerical barriers were designed not only to keep the totals low but also to favor the nations which had formerly been important sources of immigration. Britain was given by far the largest quota, Germany the second largest, and Ireland the third.

13. What are nonquota immigrants?

There are many classes of aliens admissible without regard to quotas, including natives of independent nations of the Western Hemisphere and practicing professors and ministers, all of whom may bring their spouses and minor children. The wives or husbands and unmarried minor children of American citizens married before January 1, 1948 are also admitted, provided they do not belong to the excluded Asiatic races. In recent years nonquota immigration, particularly from the Western Hemisphere, has been increasingly important, at times amounting to more than half of the total.

14. How many "war brides" were there?

Under a special law, the wives or husbands of members of the armed services and the children resulting from marriages overseas were admitted without respect to quotas and transported to this country by the government. A total of 117,999 persons came in under this act; 113,135 of them were war brides; 327 were husbands, and 4,537 children. About three-quarters of the admissions were from

Europe, 35,415 of them from Great Britain. From Germany there were 13,983; from Italy, 9,551; France, 8,692; Australia, 6,829; China, 5,687; and Japan, 757. Canada contributed 7,523.[1]

15. Are immigrants different now from 40 years ago?

The general character of our immigration has changed a great deal. Somewhat under two-thirds of today's immigrants are women, whereas a generation or two ago the sex ratio was the other way around. Instead of being concentrated in the younger adult ages, as they once were, immigrants now are spread over all ages, often traveling in family groups. To a greater degree skilled workmen, factory hands, and clerical workers are coming from Europe, while relatively fewer aliens than in the past are domestics and unskilled laborers. Formerly many had farm backgrounds, but few went into farming here. At present special efforts are being made to bring in farmers and farm workers.

16. Are the foreign-born more prolific than American women?

This used to be true, largely because the foreign-born came from places where large families were part of the accepted tradition. In recent years, however, they are at the same level as native white women in regard to the number of children. In 1910, the foreign-born averaged 901 children under five for every 1,000 women 25 to 29 years old, while native women of the same ages averaged only 712 children per 1,000. By 1940, however, the number of young children per 1,000 foreign-born women of the same ages had dropped to 524, as compared with 544 for the native population.[2]

17. In what regions have the foreign-born settled?

Most foreign-born have remained in the coastal states, although isolated national groups have settled in central areas (the Scandinavians in Minnesota and Wisconsin, for instance). Many immigrants were attracted to the industrial sections of Michigan, Ohio, Indiana, and Illinois. According to the census of 1940, New England and the Middle Atlantic states had the highest percentages of foreign-born in their white populations, around 18 and 16 respectively. The Pacific

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[1] See answer to Question 22 of Chapter III, page 40.

[2] See answer to Question 25 of Chapter II, page 23.

Coast states were third with 12 percent. (The colored population may be omitted since it is almost all native.) The East South Central states (Kentucky, Tennessee, Alabama, and Mississippi) had the greatest proportion of natives namely, 99.4 percent of the white population.

18. Are the foreign-born primarily city dwellers?

The United States has been in the process of urbanization for more than a century, and the foreign-born have accelerated the trend. Cities, of course, offer a wide variety of employment and also enable the new immigrants to live among their own countrymen. In addition, immigrants land in large cities and inertia may be an important factor in holding them there. New York, the nation's leading port of entry, had, in 1940, more than two million foreign-born residents, amounting to 30 percent of the city's white population. In the same year, 54 percent of the native population and 80 percent of the foreign-born were urban residents.

19. Has there been much emigration from the United States?

Most migrants from Europe have made America their home, but many have gone back to their homeland. During the heavy immigration years from 1910 to 1914, inclusive, when 5,175,000 immigrants were admitted more than 1,440,000 persons, or slightly less than one for every three coming in, emigrated from this country. Immigration exceeded emigration every year except during the depression period from 1932 through 1935.

20. What have been the major trends in internal migration?

Americans have traditionally been a mobile people. Between one-fifth and one-quarter of the native population recorded in every census for the last 100 years had been born in some state other than the one of residence at the time of the census. In 1940, almost 27 million persons in this country had moved away from the states where they were born. In 1950 almost one-fifth of those aged one and older were living in houses different from the homes they had occupied one year before. The migration characteristically has been from East to West, from South to North, and from rural areas to cities. Both kinds of movement are still continuing. More recently, there has been a great migration to the suburban fringes of cities.

21. What proportion of the nation now lives in cities?

In 1790, 19 out of every 20 Americans were rural residents; the United States was largely a nation of farmers. At present, only seven out of every 20 Americans live in rural areas, and, of those, less than half are farm residents. Instead of one out of 20, now 13 out of every 20 Americans are city folk. About half of them live in communities of at least 100,000 inhabitants, and the rest in places with populations ranging from 2,500 to 100,000.

22. Have the large cities grown as fast as the country as a whole?

The large cities have grown faster. New York, which has had the largest population in the country ever since the Revolution, went from 49,401 inhabitants in 1790 to 7,891,957 in 1950, a growth more than four times as fast as that of the nation as a whole. Philadelphia, second-largest city in 1790 with 28,522 persons, had 2,064,794 in 1950. The first census listed only 24 communities having more than 2,500 residents; in 1950 there were 4,270 such places. Until the census of 1840, New York was the only city which had more than 100,000 inhabitants. The 1950 census showed that 106 cities had more than 100,000 inhabitants, and 371 more had between 25,000 and 100,000.

23. Was the rural-to-urban trend ever reversed?

One-third of the largest cities of the country lost population during the depression of the 1930's. There was a slight reversal of the trend toward urbanization in the New England, Middle Atlantic, East North Central, and Pacific Coast states. These industrial sections were the hardest hit by the drop in business activity. Over the nation as a whole the movement from rural to urban areas continued during the decade of the 1930's although at a much diminished pace. In both 1930 and 49,401 inhabitants in 1790 to 7,891,957 in 1950, a growth more than War II again accelerated the migration toward cities, especially in the South and the Far West.

24. What area gained the most population in recent years?

The Pacific Coast states—California, Oregon, and Washington—showed the largest population increase; 49 percent from 1940 to 1950, while the nation as a whole gained only 14 percent. Before

World War II the Far West had been primarily an agricultural, lumbering, and fishing area. During the 1940's, however, industrial plants, shipyards and aircraft factories were set up, and workers of every kind were drawn from other sections of the country, particularly from the Central areas and the South. The boom in the Far West did not stop with the end of the war. The Coast states are still growing at a faster rate than the other regions.

25. What area lost the most by migration?

The South has had the largest net loss from migration recently. Both the Mountain and West North Central states have also had more persons move out than move in.

Despite its loss of migrants, the South as a whole grew by 13.3 percent from 1940 to 1950. Over the decade a few scattered states showed declines in number; the decrease was 4.4 percent in Oklahoma, 2 percent in Arkansas, and less than 1 percent in Mississippi. North Dakota had a 3.5 percent drop.

26. What is the racial composition of the American population?

ERRATUM

23. Was the rural-to-urban trend ever reversed?

One-third of the largest cities of the country lost population during the depression of the 1930's. There was a slight reversal of the trend toward urbanization in the New England, Middle Atlantic, East North Central, and Pacific Coast states. These industrial sections were the hardest hit by the drop in business activity. Over the nation as a whole the movement from rural to urban areas continued during the decade of the 1930's although at a much diminished pace. In both 1930 and 1940, 56 percent of the population was recorded as urban. World War II again accelerated the migration toward cities, especially in the South and the Far West.

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farms to cities. In the South most Negroes still live in rural areas but increasing industrialization, especially during the war and postwar period, has been bringing more of them into urban districts. Postwar surveys reveal that a large number of Negro veterans (about three-quarters of whom were Southern) did not wish to return to their former homes.

28. Where is the center of our Negro population?

Despite their northward and westward migration, most Negroes still live in the Southern states. However, the proportion below the Mason-Dixon Line has been decreasing. It was about 85 percent in 1920 and is less than 69 percent today. Only three states, Georgia, Mississippi, and Alabama, have about a million or more Negro inhabitants each, but in no state does the Negro population equal the white. The closest to a one-to-one ratio was found in 1940 in Mississippi where there were 1,074,578 Negroes to 1,106,327 whites.

The largest single Negro community is in New York City, where over half a million Negroes now live.

29. Has the Negro population been increasing as fast as the white?

Until recently the Negro population of this country was not growing as fast as the white. In 1850, Negroes were around 16 percent of all the people in the United States; in 1940 the proportion was only 9.8 percent. One of the most important factors in this decline was the large influx of whites from European countries. During the depression decade, however, Negroes increased slightly faster than whites and in the last decade increased further to 9.9 percent in 1950.

30. What is the ratio of men to women in this country?

In 1945, for the first time in American history, women outnumbered men. The ratio then was 996 men to 1,000 women. The ratio of males to females has been falling steadily for many years.

31. Does the ratio of males to females in the population remain the same throughout life?

At birth there is about a 6 percent excess of males over females. However, males suffer a higher mortality at every age, so that the excess of males is gradually reduced. In any generation followed from birth, the males outnumber females up to about age 50. Beyond that age, females show an excess.

32. Does the sex ratio vary with geographic region?

In general, the newer sections of the country, which grew largely from migration, had more males than females. In the West, for example, in 1910, there were 1,289 males to 1,000 females; in the Northeastern states, however, the ratio was only 1,023. In 1950, on the other hand, only the West had an excess of males over females and by a bare margin.

33. How do the sex ratios of the white and colored populations compare?

There is practically no difference in the sex ratio between the white and nonwhite populations; among the former, there were 1,019 females for every 1,000 males in 1950, compared with 1,018 among the latter.

34. What is the median age of the American population?

In 1820 the median age in the United States the age level dividing the entire population in two equal-sized groups, one older and one younger than the median – was 16.7 years. In 1950 it was up to 30.1.

35. What is meant by the expression "the aging population"?

That expression refers to the gradual heaping of persons in the older age groups of the population. In 1850, about 2.6 percent of the population was 65 years old or more; in 1940, about 6.8 percent, or approximately 9,000,000 persons, were in the old-age group. Even though there was a record increase in young children from 1940 to 1950, the proportion of the population aged 65 or more rose still further, to 8.2 percent or about 12,322,000 persons. (See Chart 1.)

The aging of our population is a result of three factors. Improved health conditions are bringing more survivors to midlife and later. The long-term downward trend of the birth rate has brought a decrease in the proportion of young children over the years. Young immigrants are no longer coming to us in the great numbers of decades ago.

than five years of schooling. Outside the South, the corresponding proportion was only 1 percent for white persons.

41. What states have the best record for schooling?

The Pacific Coast states have the best record for schooling. In the Far West the median number of years of school completed by persons 25 and over was 9.7 in 1940, compared with a national figure of 8.4. The second highest geographic division was the Mountain area with a median of 8.9 years of school. New England came third with 8.8. With respect to the percentage of the population 5 to 24 years old attending school, the Pacific Coast again led with 61.4 percent, compared with 57.7 for the whole country. The most striking variation, however, was in the proportion of persons aged 16 to 20 still studying: on the West Coast the figure was 53.2 percent in 1940, but only 41.6 percent for the nation as a whole.

42. How much has school attendance increased since the turn of the century?

School attendance has been rising steadily with the increasing urbanization of the country and the improvements in school transportation. In 1900, only half of the population aged 5 to 20 was in school; in 1950, it was 73 percent. The number of years of schooling per individual is highest in urban areas, almost as high among rural nonfarm residents, and lowest among farm residents. The need for a long education may seem less pressing on the farm since farm children begin to work at a much younger age than the children of city families.

43. What is the outlook for the size of the population of the United States?

The United States is a growing and developing nation. Its land is gradually becoming more fully settled; its cities and industries, larger and more numerous. The people of the nation are still increasing in number, although more slowly; they are also becoming better educated, healthier, and longer lived. The outlook is an optimistic one, but all these trends cannot be expected to continue indefinitely without modification. Someday the country's population will probably cease expanding but it will be beyond 200 million by the year 2000. Our country has made remarkable advances since its founding and the prospects are bright for further progress.

II

THE PATTERN OF REPRODUCTION

1. What is the normal reproductive life of women?

On rare occasions, one reads of a girl who became a mother before reaching her teens, or of a woman who gave birth when she was nearing her sixties. Such happenings are curiosities, for the reproductive span of women usually begins about age 13, and ends around age 46 or 47. The beginning age of reproduction (age at menarche) has a rather narrow range of variation. On the other hand the termination of the reproductive period (age at menopause) has a somewhat wider range of variation since the accompanying changes at this stage of life, are not as sharply defined as at menarche. In the average case, the reproductive span of a woman's life is somewhat over 30 years. There is lacking good evidence of differences in the ages at menarche or at menopause between the various races of the world or the place of residence.[1]

2. What is the normal reproductive life of men?

The reproductive life of men, especially toward the end, is much less sharply defined than for women. The birth records for the United States contain some pertinent figures in this connection. In 1948, there were only 52 fathers under 15 years of age, but about 4,900 such young mothers. In other words, the male reproductive period, as with females, begins near age 15; the difference in numbers reflects the fact that men are generally older than their wives. At the other end of the reproductive period, we find only 162 mothers of age 50 and over, but nearly 16,800 fathers at ages 55 and over. The much higher figure for older fathers than mothers indicates that there is no sudden or marked change in the reproductive capacity in the human male, but rather a long-term lessening of procreative power.

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[1] See answer to Question 5 of Chapter XXII, page 351.

3. How many babies are born in the world each year?

We really have no precise answer to this question, since adequate birth records are not kept for most of the world. This is especially the case in underdeveloped countries, where we know, from indirect evidence, that birth rates are very high. Moreover, birth rates in such areas may fluctuate widely from year to year, depending upon epidemics, famines, and economic factors. A rough estimate would place the annual number of births in the world near 95 million. This means three births every second of the day. Over three-fifths of the births are in Asia, one-fifth in Europe, and one-tenth each in Africa and the Americas.

4. How many babies are born annually in the United States and what is the birth rate?

The total number of live births in the United States during 1950, including both those recorded and not recorded, was about 3,700,000. With a midyear population of 151,689,000 for 1950, the crude birth rate comes to 24 per 1,000 population. The number of births reached a peak of 3,876,000 in 1947; this was two-thirds more than the low point of 2,307,000 births in 1933.

5. What is the average age of mothers at the birth of their children and how does the birth rate vary with age?

The average age of women at the birth of their children is 26 years, according to records for white mothers of the United States in 1948. For those becoming mothers for the first time, the average is 23 years. One-third of the babies in 1948 were born to women at ages 20 to 24 and more than one-quarter to mothers 25 to 29 years. About half of the babies are born to fathers 20 to 29 years old; the average age of all fathers is 30 years. The ages of parents at the time their children are born are somewhat lower today than at the early part of this century, largely because the ages at marriage are lower and the size of families smaller.

In 1948, the birth rate among married women under age 20 was

43 per 100; at ages 20 to 24, the rate was 29 per 100; and at ages 25 to 34, it was 15. At 35 to 44 years, however, the rate was only 4 per 100.

6. What are the chances of twins, triplets, or quadruplets?

Of the confinements in the United States during 1941–1947 in which at least one child was born alive, there were 1 set of twins for every 95 deliveries, 1 set of triplets for every 9,900 deliveries, and 1 set of quadruplets for every 600,000 deliveries. In 1947 alone, there were 38,286 sets of twins, 340 sets of triplets, and 4 sets of quadruplets. The chances of plural births rise with advance in age of the mother until ages 35 to 39.

7. What are identical twins?

Identical twins develop from the same ovum or egg and resemble each other so closely that they are hardly distinguishable. On the other hand, fraternal twins develop from two separate ova or eggs, and resemble each other no more than other brothers and sisters. Identical twins are always of the same sex, while fraternal twins may be of the same sex or of opposite sex. Just about one-third of all sets of twins are identical, and the other two-thirds fraternal. Studies of twins are of scientific interest, for they provide an opportunity to examine the relative importance of environment and of heredity in shaping the life of the individual.

8. Are more boys than girls born each year?

Counting live births alone, there are 106 boys born to every 100 girls in the white population of the United States, and 103 boys to every 100 girls in the colored population. The ratio of boys to girls tends to fall off slightly with advance in age of the mother at their birth. In twin births, the sex ratio is 103 boys to every 100 girls, while in triplet confinements there tends to be a slight excess of girls. In the case of quadruplets, there are about 150 girls for every 100 boys.

9. What proportion of married women remain childless?

Childlessness may either be voluntary or involuntary. According to census data, which do not distinguish between the two, almost one-sixth of the married women in 1940 who had passed the reproductive period of life had not borne any children. This is about double the proportion of the childless a generation earlier, in 1910. Childlessness among married women is much more common in cities than in rural areas. It is also more common for those whose schooling has extended to high school or beyond than for those with less schooling.

According to a survey conducted among a group of women in Indianapolis married from 12 to 15 years, more than one-tenth were not able to bear a child, even though desired.

10. What proportion of pregnancies fail to end in a live birth?

There are no data to indicate the situation in the country as a whole. In a survey conducted among a group of women in New York City, Raymond Pearl found that 13 percent had their pregnancy end in a miscarriage, abortion, or stillbirth. In another survey by Pearl, this time in Chicago, the failures in pregnancy came to 10.9 percent for white women and 15.9 percent for Negro women. Somewhat over 10 percent of a group of white women observed in Indianapolis reported such failure. Among this group, one percent of the pregnancies ended in a stillbirth, 7.5 percent in unintentional abortion, one percent in illegal abortion, and one-half percent in therapeutic abortion.

As a rough estimate, it may be said that somewhat over one-tenth, perhaps as much as one-eighth, of the pregnancies fail to end in a live birth.

11. What is meant by a live birth?

There is official agreement that a live birth is one where a child shows any evidence of life after its complete delivery, such as action of the heart, breathing, or movement of voluntary muscle. Birth is said to be complete when the head, trunk, and limbs of the child are entirely outside the body of the mother, even if the cord is uncut and the placenta still attached. A fetus showing no evidence of life after separation from the mother, without regard to duration of pregnancy, constitutes a fetal death (stillbirth).

12. What proportion of babies are born in hospitals?

In 1949, 87 percent of the live births in the United States occurred in hospitals; 8 percent were attended by a physician elsewhere, and

5 percent by a midwife or other attendant. This is in marked contrast with the situation in 1935, when only 37 percent of the births were in hospitals, 50.5 percent were attended by a physician outside a hospital, and 12.5 percent were delivered by a midwife or someone else. The recent situation varies widely within the country. New England and the Pacific Coast states lead in the proportion of births occurring in hospitals; the South has the smallest proportion. In our cities, 94 percent of the births are in hospitals, against 76 percent for the rural areas. Nine-tenths of our white babies first see the light of day in a hospital, as compared with little more than half of the nonwhites.

13. What is the cost of being born?

The cost of being born varies widely, depending upon whether the mother is attended by a general practitioner or by a specialist, whether the confinement is at home or in a hospital, and, in case of the latter, the type of service and room chosen. There are, in addition, the price of a layette, expenses for a housekeeper for a short period after the birth, furniture for the baby, and incidentals. According to one survey among families in the $4,000 to $5,000 annual income class, the average costs involving a six day hospital stay were:

	Semiprivate care	Private care
Doctor	$150	$175
Hospital	95	115
Minimum layette	50	50
Maid	80	80
Incidentals	25	50
Total	$400	$470

The actual costs will, of course, vary throughout the country.

14. At what season of the year are most babies born?

For many years prior to the war, the seasonal pattern for births in the United States was very stable. There was a minor peak in February or March, a major peak in July and August, and a low point in December. This pattern was obscured during the rising birth rates of the war and immediate postwar years; for example, November was the peak month in 1946. However, the prewar pattern seems to be coming back.

15. How many births in the United States are illegitimate?

It is estimated that there were about 131,900 illegitimate births in the United States during 1947, the peak year in total number of births. This is at a rate of 12 per 1,000 unmarried (single, widowed, or divorced) women at ages 15 to 44 years. There has been a steady rise in the rate of illegitimacy from the prewar level of 7.0 per 1,000 unmarried women in 1938–40. Nearly 4 percent of all births in 1947 were illegitimate; for white births, the figure was less than 2 percent, but for the nonwhite, it was 17 percent. Over 40 percent of the illegitimate births were to girls under 20 years of age.

16. What has been the trend of the birth rate in the United States?

In the early days of the country, up to about 1830, our birth rate was over 50 per 1,000 population. However, even during that period the rate was declining, first gradually and later more rapidly, until a level of 30 per 1,000 was reached by 1900. The rate fell to 28.5 at the outbreak of World War I, during which it dropped very sharply, but temporarily. A postwar upsurge in 1920 gave way to a continuation of the downward trend which reached a low of 18.4 per 1,000 in 1933, when the depression reached bottom. The recovery since then was at first slow, but it was greatly stimulated later by conditions arising out of World War II. A postwar peak was reached in 1947, with a birth rate of 27 per 1,000, the highest in a generation. Since then, the recorded birth rate has been tapering off, but it is still high by prewar standards.

17. Has there been any difference in the trend of birth rates among younger mothers as compared with older mothers?

From 1920 until the depression year 1933, the birth rate declined at all ages of women within the reproductive period. For young mothers, under age 30, the year 1933 marked a turning point, the rates rising thereafter. This rise was gradual at first, and then rapid in the early war years. A late war recession, in these birth rates under age 30, was followed by a postwar upsurge. For women at ages 30–34, the low point in birth rates came in 1936, later than for their younger sisters; for the age group 35–39 the low point was even later, about 1940, while that for ages 40–44 came in 1942.

Very closely related to the course of birth rates according to age of mother is that according to the order of the child at birth. The recovery in the rate was most rapid for the early orders of children, while those for fifth and higher orders remained stable near the low points reached after 1940.

18. What has been the trend in the average number of children borne by American women?

The decline in the birth rate has brought with it a continuous and marked reduction in the average number of children borne by American women. In the period near 1800, the average American woman bore eight children. By 1910, women at ages 50 to 54, that is, at the close of their reproductive period, had had an average of five children. A generation later, in 1940, the average was only 3.2 children ever borne per married woman.

19. How is childlessness and size of family related to age at marriage?

Much of our recent information regarding the personal factors bearing upon the size of urban families comes from a survey conducted in Indianapolis during the summer of 1941. The purpose of this study was to gather and have available the essential facts in case, at any time, legislation be considered for encouraging larger families. In order to reduce the number of elements that may affect the results, most of the study was limited to couples where both husband and wife were Protestant and native white, married for the first time, and with the wife under 30 and husband under 40 at marriage; there were a few other qualifications. From this survey, it was found that the chances that a couple will remain childless rise rapidly with advance in the age of the wife at marriage. There is also, quite naturally, a rapid falling off in the chances of a large family. It was further observed that two-child families were most frequent among those marrying under 23 years of age; among those marrying later, one-child families were most frequent.

20. What indication is there of the extent to which contraception is practiced, and of its success?

Data for the United States as a whole are lacking, but the situation undoubtedly varies widely within the country. In the selected group of native white Protestant couples included in the Indianapolis survey, it was found that about nine-tenths used contraception to control not only the number of their children, but also their spacing. Success in either prevention or postponement of a first or second pregnancy was reported by about half of the couples. After the third pregnancy about nine-tenths of the couples succeeded in the attempts to prevent another pregnancy.

21. Does the effective practice of contraception vary with the social-economic status of the family?

It has been frequently noted that the fertility of families in the higher social-economic classes is less than that of families lower in the scale. According to the findings among the selected Protestant families in the Indianapolis survey, a large part of such differences reflects the greater success of the more favored classes in planning their family size. However, among those families that planned both the number and spacing of their children, there was a tendency for the size of the family to increase with rise in the social-economic scale.

22. What proportion of couples succeed in having just the size of family they wanted?

About three-quarters of the Protestant families in the Indianapolis survey reported that they had just the number of children they wanted, while one-quarter had more than they wanted. If these proportions are any indication at all for the country, it is apparent that the course of the birth rate is influenced largely by factors that bear upon the desires of the family.

23. What is the time interval desired between the birth of children into the family?

Almost three-quarters of the couples in the Indianapolis survey thought the first child should come within two or three years following marriage. The same interval was considered desirable by about five-sixths of the couples for the spacing between successive children. However, these expressions of opinion did not conform to the actual happenings in families. Those stating that they planned both the number and spacing of their children reported greater intervals than the expressed opinion; the others reported shorter intervals.[2]

24. To what extent is the birth rate among nonwhite women greater than that for white women?

The common impression is that nonwhite women have birth rates well above those for white women. Actually, the difference in 1948 was not very great. The nonwhite rate was 122 per 1,000 women aged 15 to 44 years, compared with 103 per 1,000 for white women of the same ages. Within this broad age range, there are striking differences in the birth rates of the two races. Under age 20, the nonwhites have birth rates substantially higher than the whites. At ages 20 to 24, both are on about the same level, but from ages 25 to 34, the whites have markedly higher birth rates. From age 35, the rates for the nonwhites are again somewhat higher than for whites.

25. Do foreign-born women still have higher birth rates than native-born women?

In 1920, the birth rate among foreign-born women was about 50 percent higher than that for the native-born. This margin was reduced to 17 percent by 1930. A decade later the difference was eliminated. This means that the birth rates of the foreign-born fell, over those two decades, much more rapidly than those of the native-born.[3]

26. What is the effect of war upon the birth rate?

Countries involved in a war have generally experienced a fall in the birth rate during the war period, and a rise after the close of hostilities. However, there have been striking variations from this pattern which have been introduced by such factors as the duration and intensity of the conflict.

The birth rate of the United States was barely affected by World War I, in which it participated for only one and one-half years— from April 1917 to November 1918. There was a decline in the rate for 1919, but this was followed by a high point in 1921. World War II presented a different picture. In the short period from 1940 to 1943, the birth rate in the United States rose by 18 percent. Two factors contributed to this rise, namely, war-induced prosperity and the sharp upswing in marriages in anticipation of active service in the armed forces. In the next two years, 1944 and 1945, the birth rate declined with the large transfer of men overseas. After the end of the war, with the release of men to civilian life, there was a resurgence in the birth rate (after allowance for unrecorded births) to a level of 27.0 per 1,000 in 1947, the highest since 1921.

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[2] See answer to Question 7 of Chapter IV, page 51.

[3] See answer to Question 16 of Chapter I, page 6.

27. Does war affect the ratio of the sexes at birth?

There is no evidence that the normal excess of boy babies is increased significantly during periods of war or in the years immediately afterward. During and after World War II, the ratio of boys to girls in the United States averaged 106 to 100 in the white population, almost the same ratio that prevailed in the five years immediately before the war.

28. What is the prospect for the birth rate in the near future?

In the years immediately ahead, it is likely that the birth rate among young women having their first child will fall somewhat. Second and third births are expected to decrease also, but only slightly. Families of moderate size will in all probability continue to be popular, with large families definitely a thing of the past.

29. How does the birth rate vary geographically within the United States?

The highest birth rates are found in the Mountain and Southern states, and the lowest in the New England and Middle Atlantic states. For example, in 1949, the first group had an average birth rate of more than 27 per 1,000, while the second group averaged little less than 21 per 1,000. The difference would be even greater if allowance were made for the less complete registration of births in the Southern states.

30. How do the birth rates in the different parts of the world compare?

Birth rates are lowest in the English-speaking countries and in the countries of North, West, and Central Europe. They tend to be somewhat higher in Southern Europe and still higher in Eastern Europe.

The rates are highest in Latin America, Africa, and Asia. For example, in the period 1946–48, the United States had an annual birth rate of 24.4 per 1,000, and England and Wales 19.2. On the other hand, the rate for Mexico was 44.0, that for Venezuela 39.6, and for Ceylon 39.4.

31. How does the age distribution of the population affect the birth rate?

Obviously, a community with a very small proportion of its population at the reproductive ages of life will have a low birth rate. On the other hand, where the proportion of population at these ages is high, the birth rate will be relatively high. For example, in 1940, California had a birth rate of 16.2 per 1,000 total population, while that for the District of Columbia was substantially higher, namely, 23.1 per 1,000 total population. However, their positions are reversed when the births are related to females at the main reproductive ages. In this instance, California had 48.1 births per 1,000 females at ages 10 to 54, while the District of Columbia had a somewhat lower rate, 44.2 per 1,000. The much higher crude birth rate per 1,000 total persons for the District of Columbia is evidently a result of a much larger proportion of females at the reproductive ages. In fact, in 1940, females at ages 10 to 54 constituted 38 percent of the total population in the District of Columbia, but only 34 percent in California. Thus, the birth rates of two communities are not strictly comparable without making allowance for differences in the age structure of their populations.

32. What population characteristics, other than its age distribution, affect the birth rate?

For one thing, a population in which women greatly outnumber men at the reproductive ages will have a relatively low proportion of the women married; this, of course, has an adverse effect upon the birth rate. On the other hand, the birth rate will be relatively high in a population in which a large proportion of the couples have been recently married. The occupational distribution of its wage-earning population is also reflected in the birth rate of a community. Rates tend to be relatively high in areas where most of the people are self-sufficient farmers, and low where clerical wage-earners predominate.

If a large element of the community is made up of rather recent immigrants from areas of high fertility, its birth rate will also tend to be high.

33. What is meant by the crude rate of natural increase?

The crude rate of natural increase is the difference between the crude birth rate (Question 1) and the crude death rate. It measures the annual rate of increment, or decrement, of the population without taking into account the changes by immigration or emigration. For example, the crude birth rate in the United States in 1950 was 24.4 per 1,000, and the crude death rate 9.6 per 1,000, so that the crude rate of natural increase was 14.8 per 1,000 population.

34. What is meant by "gross reproduction rate"?

Since the birth rate of a community is influenced by its population characteristics, a valid comparison of the experience of two communities cannot be made without allowing for differences in these characteristics. One method used to allow for differences in age distribution is to compute the "gross reproduction rate." This will be clarified by means of an example.

Suppose we know the birth rates of women at each age, counting their daughters only. Thus, according to the table below, the annual births of daughters per 1,000 females is 22 at age 17 years, 65 at 22 years, and so on.

Age of Mother	Annual births of daughters per 1,000 females	Number out of 1,000 births surviving to stated age	Births of daughters among survivors
17	22	913	21
22	65	936	61
27	61	928	57
32	41	918	38
37	22	906	20
42	7	889	6
47	1	867	1
Total × 5	1,095		1,020

If the figures in this column are added and multiplied by 5 to allow for the fact that we have them only for every fifth age, the total comes to 1,095 per 1,000; the ratio is 1.095. This ratio is commonly known as the gross reproduction rate. Since it is derived only from birth rates specific for age of the mother, the gross reproduction rate is not influenced by the size or the age distribution of the prevailing female population.

The gross reproduction rate has another meaning. If we trace 1,000 girl babies from their birth to the end of their reproductive period, assuming that none die meanwhile and that they give birth to daughters at the rates shown above, they will have altogether 1 095 daughters. The gross reproduction rate thus measures the rate of increase per generation without allowance for deaths.

35. What is meant by "net reproduction rate"?

Let us suppose the generation of 1,000 girl babies of the previous question were traced from birth to the end of their reproductive period, but at the same time allowing for deaths among them. According to the example shown in Question 34, there would survive 943 to age 17 years, 936 to age 22 years, and so on. Now if the survivors to age 17 gave birth to daughters at the rate of 22 per 1,000, then the 943 such survivors would have

$$943 \times \frac{22}{1,000} = 21$$

births of daughters among them; this is the first figure in the last column. In the same way, we may estimate the births of daughters among the survivors to the higher ages. If the figures in this column are added and multiplied by 5 to allow for the fact that we have them only for every fifth age, the total comes to 1,020 per generation of 1,000 girls traced from birth; the ratio is 1.02. This ratio is known as the net reproduction rate; it will be recognized as the ratio of births of daughters in two successive generations subject to the prescribed birth rates and survivorship rates. If this ratio is greater than 1, a continuation of the prescribed rates means that the population will keep increasing. On the other hand, if the ratio should be less than one, the conditions are such as to lead to an eventual decrease in population. In the instance of the example, the excess over one, namely .02 or 2 percent, is the rate of increase per generation.

36. What do we mean by the "true" rate of natural increase?

To speak in terms of a rate of population increase per generation, as was done at the end of the previous question, is rather vague since length of a generation has not been defined precisely. To avoid this difficulty, a method has been devised to translate the rate of increase per generation to an annual rate of increase. The figure computed by this method is called the "true" or intrinsic rate of natural increase to distinguish it from the annual crude rate of natural increase, which is simply the excess of the crude birth rate over the crude death rate. (See Question 33.) The annual "true" rate of natural increase for the example used in Questions 34 and 35 comes to only .42 per 1,000.

37. How is the future age composition of the population affected by the trend in the birth rate?

A population maintaining a relatively high birth rate will have a relatively large proportion of its population at the younger ages of life and a small proportion of elderly persons. This was typical of the situation in the United States prior to the era of rapidly declining birth rates. A continual state of low birth rates, such as to yield net reproduction rates below 1, leads to a population with a relatively small proportion of children and young people, and a high proportion of elders.

38. What is the average size of family necessary to maintain a stationary population?

In the current situation of mortality, marriage, fertility, and childlessness, 283 children will be required for every 100 mothers to maintain a stationary population, or an average of 2.83 children per mother. This figure was arrived at from current mortality which shows that, out of 1,000 white girl babies traced from birth, 900 will survive to age 50, practically the end of their reproductive period. Since 90 percent of the girls eventually marry, if 90 percent of the wives bear children (see Question 9), the number of mothers among the 900 survivors is

$$900 \times .90 \times .90 = 729$$

For a stationary population, these 729 mothers will not only have to replace the 1,000 girl babies from which they arose, but they will also have to bear 1,060 boy babies, a total of 2,060 children. The average of 2.83 children per mother is found from a division of 2,060 by 729.

39. What proportion of babies is born prematurely and what are their chances of survival?

It is estimated that about 5 percent of the births in the United States are premature. These are babies born alive with a period of gestation of 28 to 37 weeks, or weighing five and one-half pounds or less at birth. According to one study, about one-fifth died within the first month of life; this is 20 times the rate for full term infants.

40. What measures are taken to safeguard the lives of premature infants?

Special medical and nursing care is being provided for prematurely born babies by many health departments. Maternity hospitals in many cities are being equipped to care for premature infants until they can be transferred safely to specialized centers in order to supply the careful long-term attention usually required. Transportation for premature infants from homes or hospitals to the centers is often provided by the city.

41. Are fetal deaths and high mortality in early infancy family traits?

Yes. According to New York State data, mothers without a history of fetal death or early death of an infant continued to experience a low fetal death rate and a low rate of early infant loss.

42. How does the mortality of infants in twin births compare with that of single births?

In a New York State study, it was found that the mortality of twins during the first month of life was over three times that of babies from single confinements.

43. Are the chances of survival of the infant related to the season of its birth?

The chances of survival are best for babies born during the summer months. Among these babies there is a smaller incidence of fetal death, premature birth, and congenital malformation and debility. Mortality from environmental causes also tends to be low for summer babies.

44. What are the principal hazards of maternity?

One-third of maternal deaths are due to hemorrhage, trauma, or shock. Infection is also a leading cause of maternal mortality and accounts for close to 30 percent of the deaths incidental to childbearing. Some deaths from this cause occur at every stage of maternity —during pregnancy, during childbirth, and after delivery. The toxemias of pregnancy (primarily disturbances of the metabolism) account for more than one-quarter of the deaths. The remaining one-tenth is caused by various other puerperal complications.

45. What has been the trend in the chances of death from conditions related to childbearing?

The hazards of maternity are fast diminishing in the United States. Since 1930, the death rate from diseases of pregnancy and childbirth has been reduced by more than 80 percent, from nearly seven maternal deaths to the present level of about one death per 1,000 live births. Both white and nonwhite mothers have benefited from this improvement, but there is still a wide gap between the two racial groups. The current maternal mortality rate of nonwhite mothers is three times that of the white.

46. How does maternal mortality vary geographically within the United States?

Maternal mortality above average is found generally in the South and Southwest, with the highest rates in the East South Central region. Rural areas and the smaller cities show rates on the average about 50 percent above larger cities. This situation probably reflects the limited facilities for satisfactory medical and nursing care for women in these places.

47. What steps are necessary to reduce maternal mortality still further?

It is generally agreed that the hazards of childbearing can be reduced still more at every stage of maternity. This can be accomplished by more widespread and more adequate prenatal care, by the provision of additional hospital facilities for confinement cases, and by raising still higher the standards of obstetrical practice. The recently approved hospital construction program of the federal government should prove of great value in this connection. Special effort should be directed toward safeguarding maternity in areas of the country where the rate is still relatively high, particularly among nonwhite women.

III

THE PATTERN OF MARRIAGE

1. What are the chances for marriage in the United States?

Nine out of every ten persons entering the marriageable ages in our country may look forward to marrying during the course of their lives.

2. Is marriage more popular now than years ago?

At present, somewhat more than two-thirds of the population in the United States at ages 15 and over are married. Only as recently as 1940, the proportion married was three-fifths, a level maintained since 1890. To some extent, the recent increase in the married population results from the decline in mortality and the consequent reduction in the incidence of widowhood. But of much greater importance have been the remarkably high marriage rates during World War II and the immediate postwar period. As a result of this boom in marriages, the proportion of single persons in the population is now at the lowest point since 1890, when data regarding marital status were first compiled for the country as a whole.

3. Do marriages increase in leap years?

There is no evidence that the marriage rate in the United States is higher in leap years than in other years. In fact, since the Civil War period, only twice was the marriage rate in a leap year higher than in the preceding and the following year; the two exceptions were 1896 and 1920.

4. Which month is most popular for marriage?

June is the most popular month for marriage in all but a few areas of the United States. In four southern states—Mississippi, South Carolina, Arkansas, and Georgia—December is the favored month. In Nevada, there is no pronounced seasonal pattern, although the summer months appear to be rather popular. In the neighboring state of Utah, May is the month of choice.

June is the traditionally popular month for those entering marriage the first time. The seasonal preference of widows and divorcees, however, is not as pronounced. Widows prefer the early fall almost as much as June, and divorcees choose almost equally between June and July. That June is not as appealing to brides who are remarrying may be explained by the fact that many of them are in the labor force or have young children in their care; they probably find the vacation period the most convenient time to be wed. It is also likely that a considerable number of young divorcees remarry shortly after the dissolution of their previous marriage, whatever the month may be.

5. How many marriages are performed annually in the United States?

In 1950, nearly 1,675,000 marriages were performed in the United States, a rise of nearly 6 percent from 1949. This spurt in marriages followed the attack on South Korea in June.[1] The all-time high of marriages was 2,291,000, reached in 1946.

6. What is the marriage rate in the United States?

Currently, there are about 11 marriages annually for each 1,000 population. Although this is much below the high point of 16 per 1,000 reached in 1946, the rate is still above the average for the four decades preceding the attack on Pearl Harbor.

7. How does the marriage rate in the United States compare with that of other countries?

The marriage rate in the United States is one of the highest in the world. When the countries with available data for 1944–48 are arranged in rank order, the list is headed by Egypt, with 14 marriages per 1,000 total population during this period. For the same period, the United States ranked second with a rate of 13 per 1,000. Rates exceeding 10 were also experienced by three other countries widely separated geographically, Finland, Israel, and New Zealand. In contrast, a number of Latin American Republics— Peru, Venezuela, Costa Rica, and Mexico—have very low marriage rates. The low standing of these countries is explained, in part, by the wide prevalence of unrecorded arrangements by which couples live together without a formal marriage, and also by the fact that the registration of civil marriages is far from complete.

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[1] See answer to Question 21 of this chapter, page 39.

8. Which states have the highest and lowest marriage rates?

In general, the marriage rate in the United States tends to increase as one moves from North to South, and from East to West. There are exceptions to this pattern, due primarily to the fact that many couples are married outside of their own states in order to take advantage of lenient marriage laws.

Thus, the highest marriage rate is recorded in Nevada, which stands in a class by itself. In 1946–48, there were recorded 403 marriages for each 1,000 persons in that state. This was ten times the figure for the next highest state, Arizona, also in the West. The marriage rate was also relatively high, more than 25 per 1,000, in New Mexico, Maryland, Mississippi, South Carolina, and Kentucky. At the other extreme, the lowest marriage rate in our country during the period 1946–48 was recorded in Tennessee, less than 6 marriages per 1,000 population. Rates of less than ten per 1,000 were also recorded in Oregon, North Carolina, Oklahoma, and California.

9. Has the marriage rate increased recently in all regions of our country?

Increases have occurred in practically all areas of the country. The most pronounced rise was recorded in the Mountain states where the marriage rate increased by 43 percent from 1939–40 to 1946–48. To a large extent, this was due to the continued growth in popularity of the marriage centers at Reno and Las Vegas, Nevada, which attract thousands of prospective brides and grooms from the adjoining states, especially California. Over the same period a decrease of 2 percent was registered in the West North Central region.

10. What are the legal requirements for marriage in the United States?

Under the Constitution of the United States, the regulation of marriage is reserved to the individual states. Congress has authority to regulate marriage only in our territories and possessions, such as the District of Columbia, Alaska, Hawaii, and the Virgin Islands.

The laws of the states vary greatly in detail and are sometimes in actual conflict; there is, however, some agreement on fundamentals. In all states it is a common policy to require persons who intend to marry to first secure the permission of the state. In order to prevent undesirable marriages, there are a large number of requirements and qualifications which must be met as a prerequisite to the issuance of a license. These have mostly to do with the relationship of the contracting parties, and their mental and physical condition. For example, all states forbid the marriage of parent and child, brother and sister, and grandparent and grandchild. All states also set the minimum age at which a person may marry, and bar subsequent marriages if a prior marriage still exists. There is an additional miscellany of requirements which are precedent conditions to the issuance of a license in some states, such as that the parties be not of different races, inmates of a home for the indigent, or habitual criminals.

11. How many states now have laws requiring premarital examination?

Thirty-nine states now have laws requiring premarital examination as a requisite to marriage. In addition, Washington requires an affidavit by the prospective groom stating that he is free from venereal disease. Thus, only eight states (Arizona, Arkansas, Maryland, Minnesota, Mississippi, Nevada, New Mexico, and South Carolina) and Washington, D.C. do not require an examination or an affidavit.

Enactment of premarital legislation began over 30 years ago. However, because the earlier laws were inadequate, they were hardly effective in the control of the venereal disease problem. Since 1936, when Connecticut passed the first of the newer laws, general recognition by health officials and citizens of the value of such laws led to their speedy adoption. These laws are not intended to prevent permanently the marriage of persons with venereal infection, but only to delay the marriage of those with communicable or potentially communicable infection until the disease has been rendered noninfectious. The success of these laws is evident from the fact that through them many thousands of cases of syphilis are discovered each year.

12. Do premarital laws depress the marriage rate?

There is evidence that new or amended legislation requiring premarital examination depresses the marriage rate, at least temporarily. For example, Delaware enacted such a law effective July 1, 1947. Immediately, the number of marriages performed in Delaware dropped abruptly from about 600 a month to less than 300. New York also experienced a sharp decline after 1937, when premarital laws became effective in that state. Apparently, such legislation induces some residents to travel to neighboring states to avoid the inconveniences of the new law. More important, it reduces sharply the number of nonresidents who come to the state to avoid the laws of their home states. Eventually, the new law loses its deterring effect on residents. On the other hand, the number of nonresident marriages remains at a lower level.

13. Are there any "Gretna Greens" left in the United States?

Even today there are places in our country which are noted for the large number of marriages performed and for the ease and promptness with which nonresident couples may secure licenses and be married. However, the number of these so-called "Gretna Greens" has diminished considerably in the past two decades as more and more states have enacted legislation requiring a premarital examination and a waiting period before marriage. The most popular marriage centers are those in Reno and Las Vegas, Nevada; Yuma, Arizona; and Elkton, Maryland. For years, Elkton was in the forefront as a "Gretna Green." However, in November 1938, Maryland imposed a two-day waiting period, and marriages in Elkton fell off immediately. Nevertheless, even in 1948 the number of persons married in Cecil County, in which Elkton is located, almost equaled the population of the county. Not all marriage centers owe their existence to relatively lenient license laws. In Chickasaw County, Iowa, for example, a romantic interest which has attached itself to the locality accounts for its popularity as a marriage center.

14. Do all couples who apply for a marriage license get married?

Apparently not, since not all marriage licenses are used. In recent years, for example, the number of marriages performed has varied from 1 to 3 percent below the number of marriage licenses issued.

15. Are most couples married in civil ceremonies?

Marriages by religious ceremony outnumber the civil by about four to one. In two states, Maryland and West Virginia, only religious ceremonies are permitted.

16. Is common-law marriage still recognized in any state of our country?

Common-law marriages are still recognized, though deprecated, in 18 states scattered throughout our country. Since the pioneer conditions which fostered common-law marriage in the United States have disappeared, an increasing number of states have enacted legislation prohibiting such marriages. Common-law marriage has no foothold among other English-speaking countries, and it is not authorized generally among other peoples. Its continued existence in our country furnishes a means of defeating the effectiveness of reforms, such as laws requiring premarital examination.

17. Is the marriage rate higher in urban areas than in rural areas?

The marriage rate is lower in urban areas. In fact, the rate is generally lowest in the very large cities. In rural areas, on the other hand, the marriage rate is somewhat higher in the small towns and villages than in the farm areas. The differences are, in part at least, explained by the relative proportions of the two sexes in the various communities.

18. Which occupations have the highest and which the lowest marriage rate?

Farmers have the highest marriage rate of all social-economic groups in our country. In 1940, for example, about five-sixths of all men employed as farmers had left bachelorhood before their 35th birthday, in contrast to fewer than three-fourths of the employed males in all other occupations. The high marriage rate among farmers is understandable, since they have to depend so largely on their own family to run both the home and the farm. The desire for companionship is also undoubtedly a factor in this situation.

After farmers, the groups consisting of proprietors and managers, skilled and semiskilled workers, laborers, and clerks follow in order in tendency to marry. The marriage rate for professional persons is lower than for most other classes. This results in large measure from their tendency to postpone marriage while starting a career. Their marriage rate in later life is, however, relatively high, since after age 45 the proportion of professional men who have ever married is practically the same as that for all classes.

19. Are the more educated people less likely to marry?

Among women, the chances for marriage decrease with advance in educational attainment. Thus, in 1947, the proportion of women at ages 35 to 44 who had ever married decreased from almost 95 percent for those with less than seven years of school to about 90 percent for the high school graduates; the proportion was much lower, 83 percent, for the women with at least a year of college. However, the women with the more extended education who do marry, tend to make a better match, in so far as the education of the husband is concerned.

Among men, by way of contrast, the marriage rate is lowest for those who have not completed seven years of school.

20. Do business conditions influence the course of the marriage rate?

Yearly variations in business conditions are an important factor in the fluctuations in the marriage rate. Prosperity encourages marriage and depression discourages it. Young people are not inclined to marry in bad times; as a result, there is an accumulation of eligible men and women who marry in good times. In the short period from 1929 to 1932, while the United States was entering its severest economic depression, the marriage rate fell from 10.1 to 7.9 per 1,000 population. In the years thereafter, the rate moved upward slowly to 11.3 in 1937 as the business situation improved. With the recession of 1938, it dropped again to 10.3 but the prosperity beginning in 1939 brought a rise.

21. How does war affect the marriage rate?

Generally, the marriage rate rises within the early period of a war, declines during its course, increases sharply in the immediate postwar years, and then reverts more or less to its prewar level. This is illustrated by the experience of the United States during World War II.

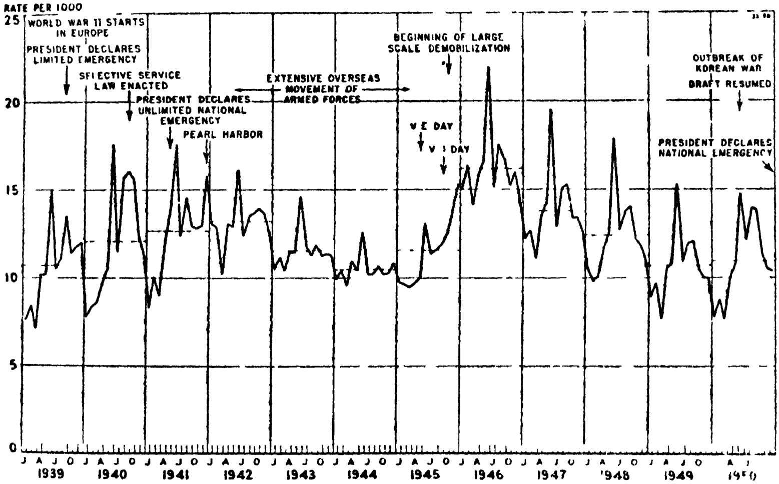

Chart 2. Marriages per 1,000 population, United States, 1939–1950.

The marriage rate started to climb in June, 1940, after the fall of France and the subsequent discussion of conscription. The upswing gained momentum after the attack on Pearl Harbor as thousands hastened into marriage in the hope of escaping induction, or in anticipation of entering the armed forces and of serving abroad. As a result, the rate reached a new peak of 13.1 marriages per 1,000 population in 1942; only three years prior, in 1939, it was 10.7 per 1,000. With the entry of increasing numbers of young men into military service and the shipment of thousands overseas, the marriage rate fell off during 1943, 1944, and the early months of 1945. Then came V-E Day early in May, and V-J Day a few months later, followed shortly thereafter by the start of large-scale demobilization. Each of these events brought an immediate upsweep in the marriage rate, carrying it to its highest level in our history. The peak rate of 16.2 per 1,000 in 1946 resulted mainly from the backlog of delayed marriages among young men who preferred to wait until the war was over, and also from the special appeal of marriage to men who had long been separated from the opposite sex and the comforts of home. In part, too, it was related to the war and postwar boom in divorce, inasmuch as many of the divorces were shortly followed by remarriage. (See Chart 2 on preceding page.)

22. Did many men in our armed forces marry while overseas during World War II and thereafter?

The number was relatively small. Such overseas marriages represented only about 1 percent of our total marriages in the years 1943 to 1947. The principal countries from which the war brides came to the United States were England, Germany, Italy, France, Canada, and Australia. There were also some from China and Japan.[2]

The number of marriages overseas in World War II was much greater than the number during World War I, when only a few thousand army and navy personnel married foreign brides. However, in comparing the experience of the two wars, several important differences must be taken into account. First, American participation in World War II lasted 2½ times as long as in the earlier conflict. Then again, our forces overseas were almost four times as great. When allowance is made for these factors, there is little difference in the marriage rate for our men abroad in the two global conflicts.

23. How is the course of the marriage rate influenced by that of the birth rate?

The birth rate influences the future marriage rate in two ways. Obviously, a high birth rate at any time means that there will be a relatively large number of young men and women eligible for marriage two decades later. One of the reasons for the record-breaking number of marriages in the United States during the 1940's was the unusually large concentration of men at ages 20 to 25 and of women at ages 18 to 23, people who were born before the very rapid decline in the birth rate. The trend of the number of births over the years also has some bearing on the future marriage rate through its influence on the proportions of the two sexes at the ages of marriage.

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[2] See answer to Question 14 of Chapter I, page 5.

24. How does immigration affect the marriage rate?

Immigrants as a class generally consist of young persons, with a concentration at ages 20 to 30, and of an excess of men over women. As a result, immigration adds to the number of young people, especially males, who are eligible for marriage.

25. Is there a greater tendency for marriage in the white population than among nonwhites?

Among both men and women at ages under 25 years, the proportion married is greater for the nonwhite population than for the white population, but the margin is becoming smaller over the years. The nonwhites also have the higher proportion married at ages 35 and over. However, within the age range from 25 to 34 years, the recent experience is that the proportion married is higher for white males than for nonwhite males; among females, the proportion is the same for both groups.

Although both racial categories have shared in the recent marriage boom, the gains have been somewhat greater for white persons, particularly at ages under 35. For nonwhite persons the proportions married at most ages are the same today as they were a generation ago. However, their marriages have changed in character. Whereas years ago common-law marriage without license or ceremony was fairly common among Negroes in the deep South and in some urban centers, certain forces in our society have caused them to formalize their marriages. For example, for Negroes who received relief funds during the depression, marriage acquired a new significance. Selective service exercised an even stronger influence in this direction, as did also the system of allotments and allowances for wives of men in the armed services. Thus, the experience of the two groups has been drawn closer together; marriage at a somewhat earlier age for the Negroes remaining as the most outstanding difference.

26. How common are mixed marriages in our country?

Racial intermarriages are relatively rare in the United States; they probably account for somewhat less than 5 out of every 10,000 marriages. Primarily, this results from the fact that such marriages are legally prohibited in 30 states, including all those in the South where our Negro population is concentrated. Nevertheless, even in the North, interracial marriages are not popular. In Rhode Island, Iowa, Kansas, and New York, for example, marital unions between whites and nonwhites average about 10 per 10,000 total marriages.

27. What are the legal requirements in regard to age at marriage?

At common law, a marriage was considered legally binding if the parties had arrived at the age of puberty, which was taken as 14 years in the male and 12 in the female. Today, by statute, the capacity to marry is generally set at 21 years for men and 18 for women. However, if the parents or guardian approve, marriage may be entered into at a lower age. Most states fix this age by statute at 18 years for boys and 16 for girls. A few states (e.g. Mississippi and New Jersey) have no statutes with respect to this requirement and, in others, the age is one or two years lower than that prescribed by the majority. Most states, however, have provisions for judicial authorization of marriages where one or both parties are under minimum marriageable age and special circumstances prevail, such as pregnancy.

28. Do people marry earlier nowadays than they did years ago?

The trend in recent decades has been toward earlier marriage. This is evident from the drop in the median age[3] at first marriage, for all men who had ever married, from 26.1 years in 1890 to about 22.7 years in 1949. The trend has also been downward for women, but the decrease has been less marked, the median dropping from 22.0 to 20.3 during the past 60 years. Another indication of the downward trend in age at marriage is the change in the proportion of young people who have married. Thus, in 1890 somewhat less than one-half of the women at ages 20 to 24 were or had been married; this rose to a little over half in 1940, but today the figure is more than two-thirds. The increase has been even greater among young men.

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[3] The median age is such that one-half of all first marriages are below it and one-half above it.

29. Do Americans marry at an earlier age than persons in most other countries?

Early marriage is more frequent in the United States than in any other country of the Western world. For example, among our women at ages 20 to 24 years, 53 percent were already married at the time of the 1940 Census. In France, which most closely approaches our experience, the proportion married at these ages at the time of their last census was 49 percent. In Belgium, Canada, and Denmark, the figure was about 40 percent; and in Australia, Italy, and Portugal, it was 31 percent. The prospects for early marriage are relatively low in Ireland and Norway; at the time the last population count was made in these countries, less than 20 percent of their young women had married. Although Americans marry relatively young, the age at marriage in our country is not the lowest in the world. In India, for example, close to nine out of every ten girls are wed before their twentieth birthday.

30. In what region of our country is early marriage most frequent?

Early marriage is most frequent in the South; in the Northeastern states, on the other hand, people marry about two years later. In 1940, the median age at first marriage for persons living in the South was 23.3 years for men and 20.7 years for women; in the Northeastern states, the figures were 25.7 and 22.4 years for men and women respectively. Early marriages are most frequent for white men in Arkansas and for white women in Oklahoma. On the other hand, residents of Massachusetts tend to marry later than those in other states.

31. What is the most popular age for grooms?

The marriage rate for single men is at a maximum at ages 26 and 27, when over one-sixth of them marry.

32. At what age is a single man considered a bachelor?

Although there is no definite age which determines when a single man becomes a confirmed bachelor, for practical purposes it may be set at about 35 years. Beginning with age 18, young men marry in increasing numbers, the marriage rate rising rapidly with each advance in age, and as a result the supply of single men is rapidly diminished. By age 30 about one-sixth of our men are still single; by age 35 the proportion is about one-eighth. While men continue to marry in later life, fewer than half of the single men who have passed age 35 eventually do so. For this reason, single men who have passed their 35th birthday may be considered as confirmed bachelors. According to this arbitrary definition, there are about 3 million bachelors in the United States today.

33. What is the most popular age for brides?

The marriage rate for girls is at a maximum at ages 22 to 24 years, when over one-fifth of them marry.

34. At what age is a single woman considered a spinster?

A woman who has passed her thirty-first birthday may be considered as a spinster in our country, since the chances are against her eventual marriage after that age. As a matter of fact, most women in the United States who marry do so relatively young. In consequence only a tenth of our women have not been married by their thirty-second birthday. Currently, there are about 2.8 million single women over 32 years of age in the United States.

35. How many years, on the average, are grooms older than brides?

On the average, the groom is about three years older than his bride. However, this is not a rigid pattern. For example, the average bride is somewhat less than three years younger than her groom where both are marrying for the first time, but more than four and one-half years younger if one of the partners was previously married. Moreover, this disparity in ages between the spouses increases with advance in age of the groom, from about one year when the groom is under 25 years of age to more than four years for grooms over age 55.

36. How often do men marry women older than themselves?

About one-eighth of all men marry women older than themselves. However, in most of these marriages only a small difference in age is involved; in only one-fortieth of all marriages the wife is older than her husband by five years or more. In one-tenth of American marriages the spouses are of the same age, and in three-fifths there is less than five years difference.

37. How frequently do single persons marry persons who have been previously married?

In general, spinsters tend to marry bachelors, and vice versa. However, about 1 out of every 11 single persons who marries takes a spouse who has previously been married. In such cases, the chances are about three to one that the spouse was previously divorced rather than widowed.

38. Whom do the widowed and divorced marry?

On the whole, persons previously widowed or divorced tend to marry persons who have been previously married. Somewhat more than two-fifths of the widows and widowers who remarry choose as their mate someone who has also been previously widowed. In the case of the divorced, a little less than two-fifths take as their new mate another who had been divorced, and fully a half enter their remarriage with a single person. Widows have a stronger tendency to marry bachelors than widowers have to marry spinsters; among the divorced, however, marriages with single persons are as frequent for men as for women.

39. Do divorced couples ever remarry each other?

Divorce does not always terminate the personal relationship between the spouses, especially when there are children involved. Thus, the divorced mates may continue to have dealings with each other, and these sometimes culminate in remarriage. However, such remarriages are believed to be relatively infrequent. It is interesting to note that of 858 marriages in 1948 in Pinal County, Arizona, 22 involved remarriages of divorced couples who had been previously married to each other.

40. What is the interval between divorce and remarriage?

Most divorced persons who remarry do so within a few years after the dissolution of their last marriage. According to the experience in New York State, about three-tenths remarry the year the divorce is granted, more than a half within the space of two years, and three-fourths before the lapse of five years. However, remarriages do occur even after 20 years, but these account for only one or two percent of the total divorced who remarry.

41. How common is bigamy in the United States?

From the very nature of the event, one would not expect data on the incidence of bigamy to be available. However, a minimum estimate can be derived from judicial statistics. The most common procedure in the United States for dissolving a bigamous marriage is by annulment. In addition, a number of states include bigamy as a ground for divorce. Judged by these divorce and annulment data, it would appear that close to 2,500 bigamous marriages are contracted annually, or at a rate of almost three for every 2,000 marriages performed.

42. How does the average age at remarriage compare with the age at first marriage?

In general, there is a substantial difference in age between first marriages and remarriages. Among men, the median age at first marriage was 24.2 years in 1948. In contrast, the median age at remarriage for men was 36.5 years, or 12 years greater than at first marriage. Women remarry, on the average, at a considerably earlier age than men and the difference in their ages between first and remarriage is somewhat smaller than for men, namely, about ten years.

43. What is the relative importance of remarriages after age 45?

Remarriages, which are relatively infrequent at the younger ages, rapidly increase in importance with each advance in age. At ages over 45, remarriages account for four-fifths of all marriages at that period of life. However, the marriages at these ages have only a negligible influence on the over-all marriage picture, since they represent only about 6 percent of the total.

44. Who has the highest marriage rate—the single, the widowed, or the divorced?

The marriage rate is highest for the divorced and lowest for the single, with the rate for the widowed intermediate. This is the case for both men and women at every age. At the younger ages, the frequency of remarriage for the divorced is very high. Among men and women at ages 20 to 24, at least one-half of the divorced undertake another marital venture. The marriage rate falls off rapidly after these peaks, but even in the next five years of life, the annual proportion who remarry is close to two-fifths.

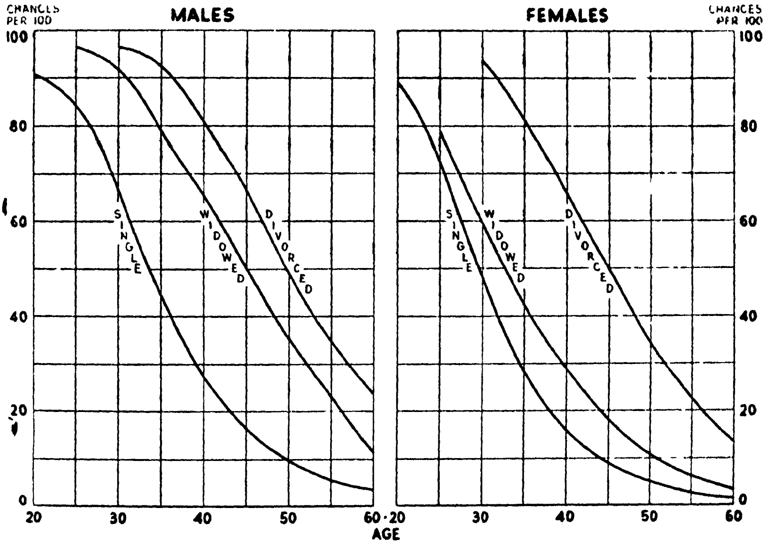

Chart 3. Chances of eventual marriage for single, widowed, or divorced persons, United States, 1940.

45. Are the prospects for eventual remarriage greater for men than for women?

The chances of marriage are greater for men than for women, whether divorced, widowed, or single. However, the differences between the two sexes are least marked among the divorced, and most among the widowed; the single fall in between the two.

Age for age and for both sexes, the chances of marriage are greatest for the divorced, not as high for the widowed, and poorest for the single. For example, a divorcee who is 30 years old has 94 chances in 100 of remarrying, while for a widow of the same age the chances are 60 in 100; a spinster of age 30 has only 48 chances in 100. For both men and women in each of the marital classes, the chances of eventual marriage decrease sharply with advancing age. (See Chart 3.)

46. What effect does the presence of dependent children have on a woman's chances for remarriage?

The presence of dependent children lessens a woman's chances for remarriage. Among women past the childbearing ages in 1940, for example, the proportion remarried of those previously widowed or divorced was one-eighth less for women with dependent children than for those without such children.

47. In what proportion of American families has the wife or husband been married before?

In somewhat more than one out of every six families, either the husband or wife was previously married.

IV

THE AVERAGE AMERICAN FAMILY

1. What is a family?

The family is the basic unit in all types of society, but its exact definition varies greatly with different cultures. In our society the family serves not only to perpetuate the race and our moral and social ideals, but it is also the basic unit of economic consumption.

For many years in this country no distinction was made in census enumerations between families and households. In 1948, however, the Bureau of the Census redefined the family as a group of two or more persons living together and related to each other by blood, marriage, or adoption. The most common form of family is husband and wife and children. A man living with his grandfather, and a woman with her niece would also constitute families. By this definition there are now close to 40 million families in the United States.

2. What is a household, and how many of them are there in our country?

A household is defined by the Bureau of the Census as a group of persons, related or not, who share common living quarters such as a house, an apartment, or even a single room. There may be more than one family in a household, and there may also be a number of unrelated persons such as lodgers or servants. One person living alone or two unrelated persons sharing quarters constitute households. Quasi households like hotels, large lodging houses, or other institutions are not included in the census count of households. In

March 1950, there were 43,468,000 households in the country, an increase of one-quarter from the figure of 34,949,000 in 1940. In the same ten-year period the civilian population of the country rose only one-seventh.

3. How many persons live alone?

There were about 8,282,000 persons, comprising 5.6 percent of the population, who were not living with relatives in April, 1949. About 6.7 million of them either maintained their own household or shared households with friends. The others lived in hotels, rooming houses, or other quasi households. Over one-third of the persons not living in families were widows or widowers, a tenth were divorced, a tenth separated, and the remainder, single. There were a great many older persons among those not in family groups, more than a quarter of them being at least 65 years of age. The proportion of households containing only one person has doubled since the first census. In 1790, around 3.7 percent of all households consisted of only a single individual; in 1900, 5.1 percent; and in 1940, 7.7. Since World War II, the proportion increased, and in 1950 it was about 11 percent.

4. What proportions of the adult population are single, married, separated, widowed, or divorced?

Of the men 25 years old or older in March, 1950, 12 percent were single, 79 percent married and living with their wives, 2 percent married with their wives absent, 5 percent widowed, and 2 percent divorced. Of the women at ages 25 and over, 9 percent were single, 71 percent married and living with their husbands, 3 percent married with their husbands absent, 15 percent widowed, and 2 percent divorced.

5. What is the average size of a family?

The average size of all families in the United States—both husband-and-wife and other types of family—was 3.56 persons in 1950. The average number of children under age 18 per family was 1.20, and the average number of persons more than 18 years old was 2.36. Urban families had only 3.42 persons, with an average of 1.05 dependent children. Rural nonfarm families contained 3.69 persons; farm families 4.02, including 1.61 children under 18.

6. How do white and colored households compare in size?

Colored households are larger than the white. In 1947, the average size of colored households was between one-eighth and a quarter greater than white households. Most of the difference was made up of dependent children, rather than of other relatives or unrelated persons. In 1940, white households averaged 2.14 dependent children, while colored households averaged 2.75.

7. What is the average lapse of time from marriage to the birth of the first child?

On an average, about two years pass from the marriage of American couples to the arrival of their first-born. After the first child, births are usually spaced about two or three years apart. In the typical family with three children, all the births occur within the first seven years of marriage.[1]

8. What proportion of husband-and-wife families have dependent children?

More than half of all the husband-and-wife families in the country had children under 18 living with them in April, 1948. The proportion was almost three-quarters for families where the husband was under 35, two-thirds where he was from 35 to 54 years old, and only one-sixth where he was 55 or more. In the case of older husbands, most of the children formerly in the family had already grown up and left home. The proportion of husband-and-wife families with dependent children rises from around one-seventh for those married less than a year to about four-fifths for those married 10 to 14 years. It drops off again later to approximately two-fifths for those married 15 years or more.

9. Are there still many large families in the United States?

Almost one-third of all the families in the country in 1950 consisted of only two persons, but there were still a great many good-sized families. One-quarter of all families consisted of three persons, one-fifth of four, one-ninth of five, and one-ninth of six or more persons. Husband-and-wife families are larger than others.

[1] See answer to Question 23 of Chapter II, page 22.

10. How does the average size of family vary according to the occupation of the family head?

A survey made on the basis of the 1940 Census showed that farmers and laborers led in the number of children, with the unemployed not far behind. Craftsmen, foremen, and kindred workers, and service workers were, on the whole, close to the average for all employed persons. Operatives had somewhat larger families, coming between craftsmen and laborers in size of family. Professional and semiprofessional persons, proprietors, managers and officials, and clerical and other white-collar workers tended to have small families, as did those in the nonworking population. Size of family varies with the education of the father; in general, the more training required for the job, the smaller the families of those who hold it.

11. In what proportion of families have the husband or wife been married more than once?

In about one-eighth of the families in the United States the wife had been married more than once, according to a survey made in 1948; the proportion was slightly higher for husbands. The proportions were much lower for younger husbands than for older ones, rising to a maximum of one-fifth for the husbands 55 years old and over. A relatively large number of those married more than once also had a spouse married more than once. This was the case even at the younger ages, where there is a choice from many persons who had never been married before.

12. To how many years of married life may a bride and groom look forward?

Under conditions prevailing for the white population in 1948, a bride and groom both aged 20 may expect to live together for 43½ years, if one considers only the probability of death and not of divorce, annulment, or separation. If the groom is 25 and the bride 20, the average duration of marriage is 40½ years. If the groom is 30 and the bride 25, they may expect an average of 36 years of married life. These joint expectations of life are necessarily lower than the expectation of life of either the bride or groom considered separately. In the case of the couple aged 20, with a joint expectation of life of 43½ years, the bride has an expectation of life of nearly 54 years and the groom 49.

13. What is the probability that the wife will outlive her husband?

In most families the wife outlives her husband. Widows today outnumber widowers about three to one in this country. The chances are almost three in five that the wife will survive her husband when both are the same age. When the husband is five years older, the chances are two in three that his wife will outlive him; and when he is ten years older, the chances rise to three in four. Only when the husband is around four years younger than his wife, are the chances of survival about the same for both.

14. What factors contribute toward the lower mortality of the married?

One study of the married and unmarried in New York State showed that married men had lower mortality rates than bachelors at all ages, but that the differential was greatest among those aged 25 to 44, when family responsibilities were also greatest. Among women, on the other hand, wives had an advantage over spinsters up to age 40; thereafter there was little difference between the mortality rates of the two groups. In part, the lower mortality of the married is the result of selection in favor of those who get married. In addition, of course, there are the direct physical and psychological advantages of family life.

15. What is a broken family?

A broken family is one which has been disrupted by divorce, separation, or the death of either the husband or wife. In April, 1949, broken families constituted one-ninth of the 38,537,000 families in the United States. Death was by far the chief cause of family disruption. Of the 4,162,000 broken families in the country, 2,874,000 were headed by a widow or a widower, whereas only 1,288,000 were headed by someone who had been separated, or divorced and not remarried.

16. Are broken homes common among the colored? How about farm populations?

The proportion of broken homes among the colored is markedly higher than among whites. In 1940, about 28 percent of the colored households, compared with 18 percent of all households, were headed by a person who was separated, widowed, or divorced. Most of this difference was caused by a much larger proportion widowed among the colored, reflecting the higher mortality of nonwhite persons.

Among farm households, only 13 percent were headed by someone who had been separated, widowed, or divorced, relatively fewer than for the country as a whole. There were proportionately fewer widows heading households on farms than in cities or in rural nonfarm areas.

17. In what proportion of broken homes are there children under 18 and what fraction of all children under 18 do they constitute?

Of the 47.7 million children less than 18 years old in 1950, 4.1 million, or almost one in twelve, lived with only one parent. About five-sixths of them (3,426,000) were with their mother, and the remaining one-sixth (674,000) with their father. Over half of these fathers with dependent children were widowers, one-third were separated from their wives, and one-tenth were divorced and not remarried. Among the women with young children, close to two-fifths were widowed, almost as many were separated, and less than a quarter divorced. There were also 3.1 million children under 18, or almost 1 in 15, living with neither parent. The majority of them were in the households of relatives. The others were in foster homes, living as wards with unrelated persons, or in institutions.

18. How many widows are there in the country?

There were over 6.8 million widows in the United States in 1950; 181,000 were less than 35 years old; 1,563,000 were between 35 and 54; and 5,094,000 were past 55. About one-quarter of the women who become widowed in a year are under 45 years old; another quarter are 45 to 54; about the same proportion are from 55 to 64; and slightly less than a quarter are over 65. There are fewer men than women widowed. In 1950, there were more than two million widowers in the country, 36,000 of them under age 35; 372,000 between 35 and 54; and 1,767,000 over 55.

19. How do the problems of widowhood vary with age?

One out of every ten widows in 1948 had children under 18, the proportion declining from more than one-fifth for those widowed less than two years to about one-thirtieth for those widowed ten years or more. Nearly half of the widows whose children were not yet six (too young to be in school) were in the labor force. The time they devoted to earning a living was taken from housekeeping or from caring for their children.

The great majority of women recently widowed maintain their own households, but the proportion decreases with the number of years of widowhood. Of those widowed less than two years, 22 percent were living with relatives, compared with 38 percent of those widowed ten years or more.

20. How do the problems of the widower differ from those of the widow?

Far fewer widowers have dependent children—less than six percent of them; moreover, the loss of his wife normally entails no loss of income for a man. Widowers with dependent children are very likely to remarry. This accounts in part for the fact that only 28 percent of the widowers, compared with 31 percent of the widows, were widowed for 15 years or more.

21. How many children are orphaned a year in the United States?

In 1948, about 371,000 children under 18 became orphans - that is, they lost at least one parent through death. Of these, 239,000 lost their fathers. One of the unfortunate aspects of orphanhood is that it is most common among those least able to cope with the problem—these are the poorer socio-economic groups who generally experience a mortality above average.

22. What are the chances that a baby just born will be orphaned before 18?

The chances of being orphaned depend upon the ages of the parents. With mortality as it was in 1930–39, the chances were 7 in 100 that a white infant whose father was 25 years old would lose him before reaching the age of 18; the chances were about 18 in 100 if the father was 40 years old. The likelihood of losing its mother was less: 6 in 100 if the mother was 25, and 13 in 100 if she was 40.

23. How many orphaned children are there in the United States?

It is estimated that there were about 3,000,000 children under age 18 in 1949 who had lost one or both parents by death. Of this total, about 1,900,000 lost their father only, 1,000,000 lost their mother only, and 100,000 lost both parents. The proportion orphaned increases rapidly with the age of the children. Only 1.2 percent of those under five had lost one or both parents, compared with 15½ percent of those 15 to 17 years old.

24. How many children have been saved from orphanhood by improvement in mortality?

If the mortality conditions prevailing at the turn of the century had continued, there would have been almost double the number of orphans estimated for 1949. The greatest proportional saving was among those who might have lost both parents; next among those who might have lost their mothers; and third, among those who might have lost their fathers.

25. At what age is the family responsibility of a father at a maximum?

Family responsibility is an inclusive concept, but if it is confined to the idea of financial responsibility it may be measured in terms of the normal consumption of adults. An adult consumption unit is the cost of providing food, clothing, shelter, recreation, medical care, and other items required by the average adult male. For the average American man aged 20, consumption measured in this way is about one unit; he is probably still unmarried and need care only for himself. In his twenties, with marriage and the birth of children, responsibilities start rising and come to about three units for the average American man aged 30. The peak of 3.75 units is reached at about the age of 40. Thereafter responsibility declines as grown children leave the home until it amounts to only about two units from age 60 on—just enough for the husband and wife.

26. What proportion of wives work?

In the spring of 1948 slightly more than a fifth of the wives living with their husbands were in the labor force; i.e., either working or looking for jobs. Nearly one-half of the women in their first year of marriage had entered or were still in the labor market, but the proportion declined with the duration of marriage. Slightly less than a third of those whose marriages (first or other) were between one and two years old were in the labor force, and only about a fifth of those married for ten years or more.

The proportion of widows working was greater than for wives, and the proportion of divorcees in the labor force was even greater. About three out of every ten widows had jobs or were looking for them. Of the divorcees, seven out of every ten in this country were working women.

27. How much has the typical family income increased since the war years?

In 1949, the average family had an income of $3,068. This is almost $500 more than the average for the war years, 1944 and 1945. For the average urban family in 1949, the money income was almost $3,500, compared with about $2,750 for rural nonfarm families and $1,600 for farm families.

28. What proportion of families are there at the high, moderate, and low income levels?

Three-quarters of the families in the nation had incomes of less than $4,500 in 1949. One-fifth of all families made less than $1,500; most of them were farm families. On the farms, one-fifth of the families had cash incomes of less than $500. However, cash incomes are not a reliable index of farm prosperity because so many farm families raise a large share of their own food.

29. In what proportion of families do both men and women participate in earning?

The proportion of families in which both men and women contribute to the family income is relatively small for the low income groups. In 60 percent of the families with incomes between $1,000 and $1,500 a year the women contribute no earnings at all; in 29 percent they contribute some, and in 11 percent they earn all the money. Among families receiving above $3,500 a year the proportion in which women help is much larger. It reaches a maximum of 55 percent for families in the $6,000 to $10,000 a year class. Above

$10,000, only 37 percent have both men and women working. In cities a greater share of families have both men and women working for pay than in rural areas.

30. How does income vary with the age of the head of family?

Income increases with the age of the family head to a maximum at ages 45 to 54, and then starts to fall. The greatest change is between those aged 55 to 64 and those 65 or over. In 1949, the median income[2] of families with the family head under 25 was $2,364; the median income of those with heads from 45 to 54 was $3,466; and for those 65 and over the comparable figure was $1,883. Urban families had a greater income than rural in every age group, but the general age pattern was the same for both. Among individuals not in families, income reaches a maximum for those aged 25 to 34, and averages, on the whole, a third of family income.

31. What is the relation of family health to income?

Low income families have more frequent attacks of illness and more days of disability from sickness per person than do families in more comfortable circumstances. A similar relationship exists with respect to mortality. Infant mortality, maternal mortality, and the death rates from a number of causes of death vary inversely with income.

32. How do most families budget their spending?

Food is the largest single item of expenditure for American families. The table on page 59, based on family income for 1941, shows the distribution of expenditures for current consumption of average American families. It does not indicate money spent for insurance or for gifts and charitable contributions. A postwar sample survey in three cities showed little relative change in the proportion of total spending for each of the main classifications.

33. How do family expenditures vary with increased income?

With a rise in income, the proportion spent on food and shelter declines, while relatively more is spent on clothing, recreation, and on an automobile. Home furnishings take an increasing share and savings, insurance and charitable donations also rise proportionately, but medical care apparently consumes about the same fraction of total expenditures for families within most income groups.

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[2] One-half of the families referred to have incomes under the median income specified.

Percent Distribution of Major Categories of Consumption for Families of 2 or More Persons, 1941

Item	All families	Urban	Rural non farm	Rural farm	$1,000-$1,500 income	$3,000-$5,000 income
All items	100.0	100.0	100.0	100.0	100.0	100.0
Food	32.1	29.6	34.9	43.7	36.9	28.3
Home (incl. fuel, light, etc.)	25.2	26.9	22.7	19.7	25.4	24.2
Furnishings & equipment	5.4	5.2	6.1	5.3	5.6	6.2
Clothing	12.2	12.5	11.6	11.5	11.3	13.4
Auto & other transport	10.9	11.1	11.3	8.1	8.3	12.4
Medical care	4.4	4.3	4.8	4.5	4.4	4.6
Recreation	3.6	4.1	2.4	2.0	2.2	4.3
All others	6.2	6.3	6.2	5.2	5.9	6.6

34. How do family savings vary as the head of the family ages?

Family savings on the average increase with the age of the head of the family. The greatest proportion of families with relatively small annual savings in relation to their incomes are found among those whose heads are less than 25 years old. Even among those in the 25 to 34 year old group a large number of families save very little. Not only are the costs of getting a family going, buying a home and all the other expenses of the first ten years of married life high, but men under 35 are still a long way from their peak earnings. After about the age of 45 there is a spurt in the proportion of families saving in relation to their incomes. Because of decreased family costs and increased income, this spurt in savings may continue until the head of the family retires from active employment.

35. What factors enter into a consideration of the money value of a man to his family?

Broadly speaking, the money value of a man to his family is the present worth of his future earnings less the cost of his maintenance. Calculation of this amount involves a consideration of the chances of employment, probable future earnings for each period of his career, the expected chances of survival (which depends on the individual's health and environment), the probable savings at each age, future interest rates, and the size of family.

36. What is the money value of a man at various ages and earning levels?

The money value of the average man at various ages and earning levels is shown in the table below.

Present Value of Net Future Earnings for Men of Specified Age and Annual Earnings,* Based upon Mortality of White Males in the United States, 1939–1941, and Interest at 2½ Percent

SPECIFIED AGE	ANNUAL EARNINGS* AT SPECIFIED AGE		
	$2,500	$3,500	$5,000
30	$32,300	$53,200	†
35	26,600	40,600	†
40	21,300	32,300	$54,500
45	16,000	24,700	41,900
50	11,000	17,300	30,100
55	6,100	10,000	18,700

* After deduction of income tax

† Earnings of $5,000 per annum, at the ages specified would indicate ultimate earnings above $10,000 per annum. The collection of estimates of which an excerpt is here presented, does not extend to these higher earning brackets.

37. What proportion of homes are owned by their occupants?

Of the 39,000,000 dwelling units occupied by residents in the United States in 1947, about 55 percent were owned by the families who lived in them. In urban areas only about 48 percent were owner-occupied, compared with about 65 percent in rural areas. Since 1940 there has been a marked rise in owner occupancy. Before World War II only 44 percent of all homes in the nation were owned by the persons living in them.

38. How many persons are there per room in most households?

In the country as a whole, 35 percent of the households averaged no more than one person for every two rooms in 1947. Another 59 percent had between one and three persons for every two rooms, and only 6 percent had more than three for every two rooms. Farm families were more crowded than others, with 10 percent of them averaging at least three persons for every two rooms. There was a decided difference between tenant- and owner-occupied dwellings, the tenants being much more crowded.

39. What rents do most people pay in the United States?

Almost three-quarters of the tenant-occupied dwelling units in urban and in rural nonfarm locations rented for less than $40 a month in April, 1947. The median monthly rental was $29.33, varying from $33.24 in the Northeastern states to $19.03 in the South. The median figure for rural nonfarm units alone was $18.62.

40. What parts do governmental programs and private insurance play in family protection?

Securing the family against the economic and health hazards of modern life is one of the major aims of the society in which we live. Life insurance and annuities help families and the survivors of death-broken homes to stay together. In addition, private health and hospitalization insurance now aid about one-half of the entire population in meeting the financial problems of illness and accidents. Private pension and retirement plans are being rapidly extended. Private insurance and personal savings are the primary source of protection for most families. The federal, state, and local governments, however, provide a variety of financial aids. The federal government operates old-age and survivors' insurance, paying benefits to persons reaching 65 and to their wives or, under the survivor's plan, to the dependents of insured persons who have died. In addition, the federal government contributes to the state unemployment insurance and public assistance programs which aid needy families and children and also the blind, as well as those out of work. Under state laws, various workmen's compensation benefits are available to workers or their widows in case of occupational accidents or illness. Several states also have laws providing for the insurance of workers against total loss of income because of illness. And finally, the states and localities operate general assistance programs for those not eligible for the other forms of aid.

Private and public contributions to the protection of the family are tremendous. In 1949, for example, 1,359,000 life insurance claims were paid by private companies in the United States, the total benefits reaching nearly one and one-half billion dollars. More than half of the entire country was insured at that time and the average amount per family was more than $5,000. The various governmental programs in July, 1949, were paying benefits to approximately one out of every ten persons, though this figure includes some duplications for those receiving payments under more than one government assistance plan.

V

MARITAL DISSOLUTION BY DIVORCE,[1] SEPARATION, AND DEATH

1. What are the chances that a marriage will end in divorce?

Currently, about one out of every ten marriages is dissolved by divorce or annulment within the first five years of marriage and about one out of every six within the first ten years. If recent trends in divorce and mortality continue unchanged, somewhat less than one out of every three marriages started in the past decade will eventually end in divorce and at least two-thirds will last until the death of either the husband or wife.

2. How many divorces are granted annually in the United States?

Almost 400,000 divorces and annulments are now granted each year. This is a sharp drop from the peak year 1946, when about 629,000 were granted. By contrast, however, in no year prior to World War II did the figure reach as high as 300,000. The greater number of divorces granted currently is due in part to the increase of our married population, but more especially to the rise of the divorce rate.

3. What has been the trend of our divorce rate?

The divorce rate in the United States has risen with few interruptions throughout our history. In a period of roughly 80 years, it has increased six-fold. Immediately after the Civil War, the rate was less than two divorces annually per 1,000 married couples; by the beginning of World War I, it was about five per 1,000; and at the time of Pearl Harbor, it was almost ten per 1,000. At present, about 10½ divorces are granted each year for every 1,000 married couples. Although this is a pronounced drop from the postwar peak of 18½ in 1946, it exceeds the rate for every year prior to 1943.

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[1] In this chapter, the term "divorce" includes absolute divorce and annulment; limited divorces such as bed and board, legal separation and separate maintenance decrees are grouped together under the general term "separation" and are treated only in questions 43 to 46.

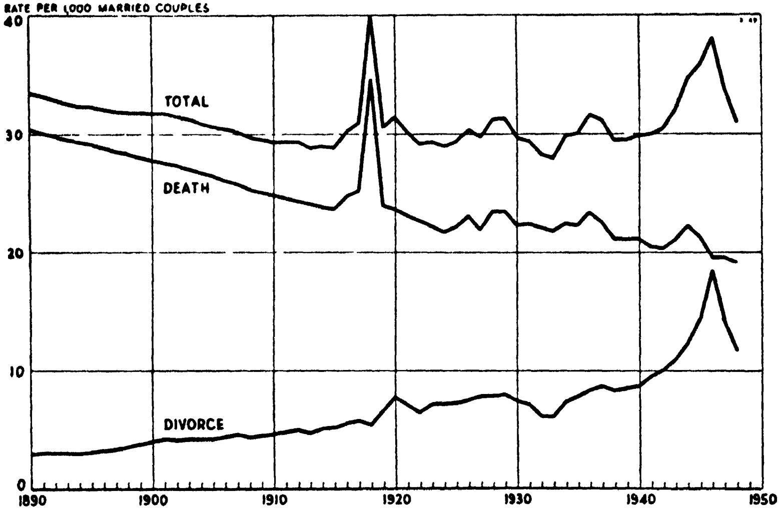

Chart 4. Marital dissolutions by death and divorce, United States, 1890–1948.

4. Are there more divorced (and not remarried) women than men in the United States?

In March, 1950, close to three-fifths of our divorced (and not remarried) population were women. In fact, every federal census since 1890—the first to make available statistics by marital status—has reported more divorced women than men. The excess of divorcees results primarily from the fact that the remarriage rate is higher for divorced men than women, and also from the higher mortality rate for men.

5. Is there a most popular month for divorce?

Although there is some seasonal variation in divorce, it results primarily from the laws and court procedure rather than from the choice of those getting divorced. Since most courts take a summer recess, fewer divorces are granted during those months. In 1948, for example, the daily average number of divorces in August was fully one-sixth below the average for the year.

6. How does the divorce rate in the United States compare with that in other countries?

With the possible exception of Egypt, the divorce rate in the United States is probably the highest in the world. In 1936–38, the most recent period for which reasonably comparable data are available, the rate in Egypt was 17.4 per 1,000 married couples---roughly double the rate of 8.4 in the United States. Our rate, in turn, was about double that of the next two ranking countries—Austria and Denmark—-where somewhat more than 4 divorces were granted annually for every 1,000 couples.

Throughout the world, the long-term trend of divorce has been upward almost universally. In countries like Canada and England, where the rate formerly was comparatively low, the rise has been particularly sharp in recent years. In consequence, the disparity among most nations is much smaller today than before World War II or at the turn of the century.

7. Has divorce increased in frequency in all regions of our country?

Substantial increases have been recorded in all regions. The most pronounced rise, however, has occurred in the South. More liberal laws in the District of Columbia and in Florida resulted in sharp increases in these areas even prior to World War II. The divorce rate has also climbed rapidly in North Carolina, Georgia, and Alabama. In general, the rise has been greater in states where the rate was formerly low, with the result that the differences between regions have been somewhat reduced. Relative to its population, the West today has three and one-third times as many divorces as the Northeast; prior to the depression, it had four times as many.

There is a clear geographic pattern in divorce which has remained relatively unchanged. In general, the frequency of divorce tends to increase as one moves from East to West, and from North to South.

8. How do urban and rural divorce rates compare?

The divorce rate has long been higher among the urban than the rural population. As a consequence, the rapid growth of urban communities in our country has contributed to the rise in the national divorce rate. However, the indications are that since 1940 the divorce rate has increased more rapidly among the farm population than among city dwellers.

9. Do all states grant divorce?

Today all states grant divorce. South Carolina, which from 1878 to 1948 had no divorce law and granted only annulments, was the last to enact such legislation.

10. Which state has the strictest divorce law?

New York State stands in a class by itself, since absolute divorce may be granted only for adultery or for presumed death after an absence for five successive years (Enoch Arden decree). Moreover, the New York law prohibits for three years the remarriage of the guilty party in an adultery case. The result is that New York State, which contains almost one-tenth of the country's population, grants less than one-fortieth of the absolute divorce decrees.

11. Which cities are the meccas for divorce in our country?

Reno and Las Vegas, Nevada, and Miami, Florida, undoubtedly attract the largest number of persons in the United States who migrate for the purpose of securing a divorce. This is understandable since both Nevada and Florida have liberal divorce laws; in each, the decree is final upon entry of the court's judgment and either party may remarry at once. In Florida, only 90 days' residence is necessary before bringing suit, and in Nevada only 6 weeks. Moreover, in all three of the cities mentioned, the hotel and entertainment facilities are conducive to residence long enough to meet the legal requirements.

12. Do any states besides Nevada and Florida have liberal residence requirements?

Arkansas and Wyoming require a residence of 60 days, and Idaho only six weeks. In contrast, in Connecticut and Massachusetts at least three years' residence is necessary before divorce proceedings may be instituted. Most other states require a residence of one year.

13. How many go outside the country for a divorce?

Fewer than 3,000 of our marriages are dissolved annually by divorces obtained outside the country. Mexico probably accounts for at least nine-tenths of the total. Our possession in the Virgin Islands is also said to be catering to divorce-seekers from the states. Although the number of these decrees in the Virgin Islands has been increasing slowly since 1945, it has not yet reached much above 100 a year. Divorces secured in recent years in other foreign places, such as Paris and Havana, are believed to be even fewer in number.

14. Are all applications for divorce granted?

In the country as a whole only about three-fourths are granted. The proportion varies considerably from state to state, and even from county to county within a state, according to the customs and practices of the courts.

15. How does war affect the divorce rate?

Immediately after the end of a war, the divorce rate generally rises sharply. This was certainly the case in our country after the two world wars, and there is evidence that a postwar rise also occurred after the Civil War. Apparently, hasty courtship, long separation, and the general difficulty of readjustment to postwar life lead to instability in many war marriages. After the recent war, the rise in divorce was sharpest among those married less than five years—essentially those married during the war.

16. How do business conditions affect the divorce rate?

In general, there are more divorces in periods of prosperity and fewer in depressions. With the improvement of economic conditions in the years preceding Pearl Harbor, the divorce rate in the United

States rose. The recent war and postwar boom in divorce may also be explained in part by the war-induced economic prosperity. This is especially true for the early war years when the divorce rate went up most abruptly among couples married ten years or longer. Very likely, some of these divorces were postponed from the depression period. Inability to pay alimony and the costs of court litigation are undoubtedly factors in the decline of marital dissolutions during periods of deflation. But that is not all: hard times may also curtail hasty marriages.

17. Which occupations have the highest divorce rate?

In general, divorce rates are high in occupations involving irregular hours or frequent absence from home overnight, and those requiring association with the opposite sex with little or no community chaperonage. Actors, traveling salesmen, musicians, military personnel, seamen, and physicians appear to have more than their share of divorces, while clergymen, farmers, and miners have fewer than average.

18. Is the divorce rate higher for native white Americans than for the foreign-born?

Yes, and among the native whites, the third generation Americans have a higher divorce rate than the second generation. The relatively low divorce rate among the foreign-born results from a number of factors. Since the rate in the country from which they have emigrated is comparatively low, the foreign-born are culturally less inclined to seek divorce in case of marital difficulty. General distrust of courts and language difficulties also contribute to the low frequency of divorce among them.

19. Is the divorce rate lower for Negroes than for the white population?

The best available evidence indicates that nationally the divorce rate is lower among Negroes. Desertion and informal separation, however, have long been common occurrences among them. This is especially the case in the rural South, but these practices have also been carried along generally with the Negro in his migration to northern and urban centers. In addition, the cost of divorce is a greater deterrent to

Negroes because of their lower income. Thus, Negroes in our large cities contribute a disproportionate share of desertions, but not of divorces. In recent years, however, the situation has been changing. The divorce rate has increased more rapidly among Negroes than whites. In some areas, the Negro rate has already surpassed the rate for whites.

20. Is the divorce rate affected by the marriage rate?

A rise in the marriage rate means proportionately more newly married couples. Because the divorce rate is highest in the early years of marriage, the number of divorces rises faster than the total number of married persons; this situation leads to an increased divorce rate. The relationship works both ways. A decline in the marriage rate is subsequently followed by a decrease in the divorce rate.

21. What has been the trend in the divorce rate among newly married couples?

The divorce rate has risen sharply at all stages of married life. Over the quarter of a century since 1922–24, the rate among couples married less than five years more than doubled. Somewhat smaller increases were recorded for families of five to 20 years standing; for longer-term marriages, the rate did not quite double during this period.

22. What proportion of divorces are granted in the first ten years of marriage?

Currently, about two-fifths of all divorces and annulments are granted to couples married less than five years, and one-fourth to those married for five to nine years. The remaining divorces are spread out over many years of marriage, with the proportion decreasing as the duration of marriage is extended. Even so, couples married 20 years or more are granted about one-ninth of all divorces.

23. How frequent are divorces among couples married more than 20 years?

Currently, four divorces are granted annually for every 1,000 couples married 20 years or longer. The divorce rate, of course, is not uniform for all years of marriage after the twentieth. From about eight per 1,000 at the twentieth anniversary, it falls steeply to less than two per 1,000 by the fortieth year of marriage. A few couples get divorced even after their golden wedding anniversary. In many of the divorces effected decades after marriage, the husband and wife have already been living apart for years.

24. Do the chances of divorce vary with the age at marriage?

The chances of divorce do not change much within the normal range of age at marriage—from around 17 to 40—but beyond these very rough limits the likelihood of divorce appears to be greater. Similarly, there seems to be little variation in the frequency of divorce in marriages where the wife is older by not more than five years or where the husband is older by not more than ten years. Where there are great age gaps between marriage partners, there is a tendency toward extremes in adjustment— either very good or very poor. The younger party to such a marriage, or either one if both are relatively young, is likely to seek divorce once marital difficulties arise, because the chances of remarriage are still good.

25. At what age is divorce most frequent?

The divorce rate is at a maximum among men and women not yet 25; thereafter, it declines throughout life. For husbands past 55 and wives past 50, the rate is less than one-half the average for married persons of all ages.

26. Are the divorced and widowed good marriage risks?

In general, they are not. Although many second marriages are successful, as a group the divorced and widowed who have remarried experience a relatively high divorce rate. In Iowa, for example, where remarrying brides and grooms constitute only one-sixth of the total marriages, persons married more than once account for one-fourth of all divorces. Moreover, it appears that the frequency of divorce rises substantially with each successive marriage.

CHILDREN IN DIVORCE

27. Are most divorced couples childless?

About three-fifths of all marriages currently dissolved by divorce or annulment involve no children under 21 years of age. This is due primarily to the heavy concentration of divorces and annulments in the early years of marriage when couples are less likely to have children. Thus, less than one-third of the couples divorced before the seventh wedding anniversary have children. By contrast, children are actually involved in more than one-half of the divorces granted to couples married 7 to 23 years. At the longer durations of marriage, the proportion of divorces which involve dependent children is again small because most of the offspring have already grown up and left home.

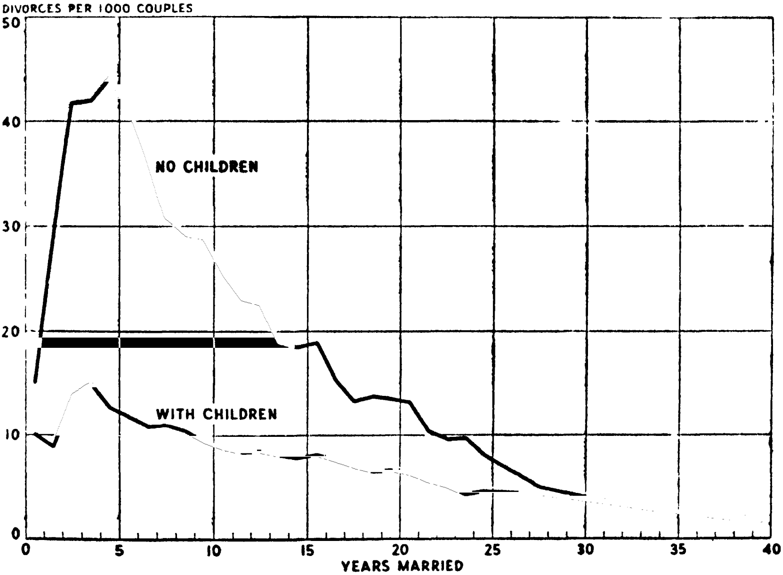

Chart 5. Divorce rate for married couples with and without children under age 18, according to duration of marriage, United States, 1948.

28. Do children lessen the chances of divorce?

In the first twenty years of marriage, divorce is two to three times as frequent among the childless as among those with children. After the twentieth year of marriage, the differential between the childless and those with children diminishes rapidly and disappears completely by the thirtieth. The rate of divorce also drops with rise in the number of children. For couples with four or more children, it is considerably less than half what it is for those with only one child. (See Charts 5 and 6.)

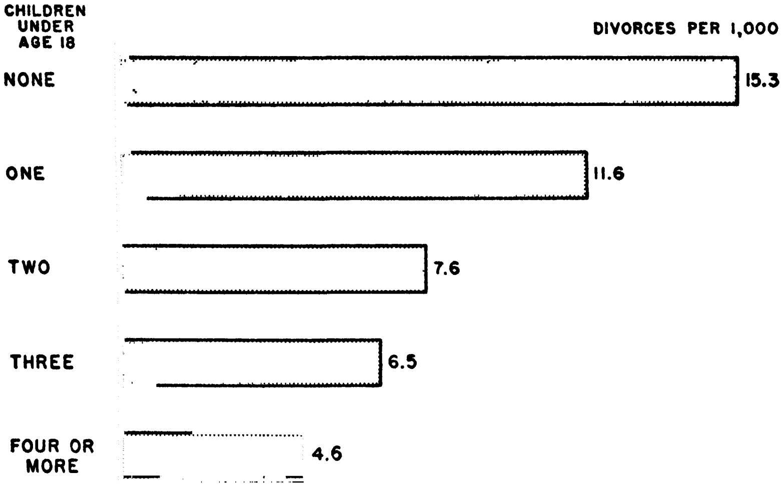

Chart 6. Divorces per 1,000 married couples by size of family, United States, 1948

Although it would seem reasonable to ascribe some of these differences to parental affection and responsibility, it is probably also true that the absence of children is in itself not necessarily a cause of divorce. Both divorce and childlessness result from more fundamental factors in the marital relationship.

29. How many children are affected by divorce?

About one-third of a million children under 21 years of age have been affected by divorces or annulments granted in each of the postwar years, or roughly three children for every four marriages dissolved.

30. Is the number of children affected by divorce increasing more rapidly than the number of divorces?

Both have increased, but the uptrend has been sharper for the number of children affected. The proportion of divorces involving children has grown from about 38 percent during the period 1922–32 to 42 percent in 1948. As a result, the average number of children per divorce has risen from 0.68 to 0.74.

31. To whose custody are children of divorced couples generally entrusted?

The mother receives custody of the children in two-thirds to four-fifths of the cases; the husband is awarded custody in about one-sixth. In the small remaining proportion of divorces the children are awarded to someone else, or no provision is written into the decree. Generally, children are awarded to the petitioner for divorce, which is usually the wife. In most instances in which the husband is the plaintiff, he is awarded the children. There is also some tendency for the mother to be given custody of girls and the father of boys. Regardless of the custody award, however, most divorce decrees make provision for the other parent to visit or to be visited by the children.

COURT PROCEDURE

32. What proportion of divorces are granted to the wife?

Divorces are normally granted to the plaintiff, i.e., the one who starts the court action. This is the wife in three out of every four cases. The reason the plaintiff usually gets the divorce is that all but a handful of divorce actions are uncontested.

33. What are the legal grounds most frequently alleged in divorce actions?

Cruelty accounts for about one-half of all decrees granted, and is by far the most frequent cause among those married only a short time. Desertion is the second most frequent cause alleged in divorce actions; it increases in importance with advance in the duration of marriage. After the twenty-fifth year of marriage, desertion is the most frequent recorded cause.

34. In what proportion of divorce cases is alimony granted?

Alimony is granted in a little more than one-fourth of the divorces granted. The chances of receiving alimony, maintenance, or support vary from state to state, and are about five times as great in Wisconsin as in Florida. There are some indications that the trend is toward curtailment of alimony, and many decrees now stipulate that payments shall cease upon remarriage of the ex-wife, or that there be a mandatory revision of payments upon her remarriage.

35. Are husbands ever granted alimony?

In recent years there have been court decisions to the effect that husbands are also entitled to alimony under certain circumstances. However, requests for alimony by husbands are extremely rare and can only be granted in those states in which specific statutory authority allows it. In general, requests for alimony are granted most frequently when the welfare of children is involved. Since most children are awarded to the custody of the wife rather than the husband, husbands rarely get alimony.

ANNULMENT

36. What is the difference between annulment of a marriage and divorce?

An annulment of a marriage is a legal decree that no valid marriage was contracted because of some condition which existed at the time of marriage. A divorce, on the other hand, is a legal decree which dissolves or partially suspends a legally recognized union for some action or occurrence after the establishment of the marriage. In modern law, the term "divorce" is usually specifically applied to *Divorce A Vinculo Matrimonii* or absolute divorce, in contrast to *Divorce A Mensa Et Thoro* or separation from bed and board. The first type of divorce puts an end to the marriage, the second authorizes separate maintenance, but leaves the marriage bond in full force.

37. What are the grounds for most annulments?

Fraudulent representation, being under the legal age for marriage, and bigamy, in the order named, are the most frequent grounds for annulment in the United States and account for fully four-fifths of the total. "Fraudulent representation," which is by far the most popular cause alleged in California and New York, is a general phrase covering a number of specific causes, such as misrepresentation of financial standing or willingness to have children, deception as to character, and physical incapacity. In most other states, bigamy accounts for the largest number of annulments.

38. How many annulments are granted annually in the United States?

An average of 13,000 annulments has been granted annually in recent years. The number rose to an all-time high of about 22,000 in 1946, but has since declined.

39. Do annulments constitute a large proportion of all legal marital dissolutions?

In the country as a whole, annulments constitute only a little more than 3 percent of the total legal marital dissolutions. In California and New York, however, they account for much greater proportions; in California, about one-ninth, and in New York, almost one-third. Both states have relatively restrictive laws governing absolute divorce: in California, there is a one year interlocutory period before a decree becomes final; and in New York, aside from Enoch Arden decrees, adultery is the only ground for absolute divorce and the "guilty" party may not remarry for at least three years.

40. Have annulments risen more rapidly than divorces in recent years?

After World War I, annulments represented about 2 percent of all legal marital dissolutions in the United States; today, they account for more than 3 percent.

41. In what period of marriage are annulments granted?

About four-fifths are granted in the first five years of marriage. In general, however, there is no time limit within which an annulment must be requested. In fact, a small number occur even after 20 years of marriage.

42. Are annulments ever granted to couples who have children?

If there are legal grounds for annulment, the presence of children does not prevent its being obtained. At common law, the children of couples whose marriages had been annulled were considered illegitimate, but many states now have statutes which specify the legitimacy of such offspring. Some states have even modified their divorce law to include the grounds for annulment, in order to protect the interests of the offspring and parties to a marriage which is annulled.

SEPARATIONS

43. How many legal separations (bed and board decrees) are granted in the United States each year?

Probably fewer than 15,000 legal separations a year are granted in the United States. This is roughly equivalent to one legal separation for every 25 absolute divorces or annulments granted. Some of these separations are followed by absolute divorces in subsequent years. Legal separations are, of course, not the only kind which occur. Some separations are informal, as separation by private agreement, abandonment, or desertion.

44. How many abandonments or desertions occur each year?

It has been estimated that more than 50,000 abandonments or desertions take place each year, with the husband usually the deserter. Desertions, or "poor men's divorces," are not always permanent; the deserter in many instances returns voluntarily to his family, perhaps only to repeat the performance in a subsequent year. In some cases, however, the act of desertion becomes the basis for a later divorce.

45. How many couples separated either legally or informally are there in the United States?

At any one time, the husbands and wives of close to one million marriages—almost 3 percent of the total of all couples—are living apart in the United States. This figure includes those who have already applied for an absolute divorce, those separated legally, and those separated by private agreement or no agreement at all. Since some of them continue to live apart for the balance of their lives without ever getting divorced, there is a gradual increase in the frequency of separated couples with advance in age.

46. Are there more separated couples in states with low divorce rates?

In general, no. Nevada, for example, with one of the most liberal divorce laws and the highest recorded divorce rate, also ranks first in frequency of separated couples. At the other extreme, South Carolina.

which used to grant no absolute divorce, has one of the lowest recorded rates for separated families. Some of the Northeastern states, however, are exceptions to the rule. New York State, with the strictest divorce law and one of the lowest recorded divorce rates ranks near the top in the frequency of separated couples. Similarly, Connecticut, Massachusetts, New Jersey, and Rhode Island have low divorce rates, but in all four states a relatively large number of husbands and wives live apart.

ROLE OF MORTALITY IN MARITAL DISSOLUTIONS

47. How many families are broken annually through the death of either husband or wife?

Close to 670,000 families are broken up each year by death, two-thirds of them by the death of the husband. The husband usually dies first because the rate of mortality among men is higher than among women and because the husband is generally several years older than his wife.

48. What are the chcnces that a wife will outlive her husband? [1]

49. To how many years of life together may a bride and groom look forward? [2]

50. Are more children affected by divorce than become orphaned?

Despite the decline of mortality and the rise of divorce, the annual toll of orphans is still greater than the number of children affected by divorce. Currently about 371,000 children under 18 become orphaned each year, whereas not quite 300,000 children under 18 are annually affected by divorce.

51. What is the relative contribution of death and divorce to the total of marital dissolutions?

Death breaks more families than divorce, but the relative importance of divorce has been increasing almost steadily throughout our history. In 1890, divorce accounted for less than one-tenth of all marital dissolutions; today, the figure is close to four-tenths. The

[1] This is answered in Question 13 of Chapter IV, page 53.

[2] This is answered in Question 12 of Chapter IV, page 52.

relative contribution of death and divorce in breaking up families varies with the duration of marriage. In the early years of marriage, divorce constitutes a far greater hazard to the continuity of family life than death. In the third year of marriage, for example, the divorce rate is about three and a half times the disruption rate from the death of either husband or wife. It is not until about the fifteenth year that divorce becomes less frequent than death. Thereafter the frequency of divorce continues to fall and death takes an increasing toll.

52. Has the breakup of families become more frequent?

Not in the past 60 years at least. The upswing of divorce has been more than offset by the decline in family disruptions due to mortality. From 1890 to 1915, the combined rate of marital dissolutions dropped from 33 families broken annually per 1,000 to 29 because of decreasing mortality. The explosive rise in marriage dissolutions in 1918 to a high of 40 per 1,000 was also primarily a reflection of the death rate, in this case of the influenza pandemic which struck in the autumn of that year. (See Chart 1 on page 61.)

After the influenza outbreak and until the beginning of World War II, the rate of marital dissolutions fluctuated with no definite upward or downward trend, although early in the depression the rate dropped to the lowest point of the entire series –very likely the lowest in our history. Throughout World War II, marital dissolutions rose rapidly as a result of the mounting divorce rate and reached a high of 38 per 1,000 in 1946. With the readjustment to peacetime life, the divorce rate receded so sharply that in 1948 the level of total dissolutions was almost back to where it had been before the war.

VI

THE SICK AND THEIR CARE

1. What is health?

Although there are many concepts of health, perhaps the best is that stated in the charter of the World Health Organization. According to this definition, "Health is the state of complete physical, mental, and social well-being and not merely the absence of disease or infirmity."

2. Through what agencies is this ideal achieved?

First and foremost are the medical and the allied professions. They care for the sick and conduct the research which extends our knowledge of the causes of diseases and the best ways to treat them. They direct the huge facilities which have been built to protect the health of the people and are a powerful force in educating the people in personal hygiene.

Next are the public health authorities, primarily concerned with preventive measures. They protect our food and water supplies, maintain sanitary standards, provide for immunizations, maternal and child health clinics, and for a multitude of services which help to maintain the health of the people. Our voluntary health agencies are an important element in our health system. They have pioneered in demonstrating new fields of health control, they support medical research, and they carry on intensive campaigns of health education directly to the public.

Finally, there is the informed public who because of their knowledge cooperate with the medical profession, the public health authorities, and the voluntary health agencies. The public also supports our voluntary agencies. These joint forces—medicine, public health, voluntary agencies, and enlightened public—are our best guarantee for the achievement of the ideal of good health.

3. What is illness?

To define illness is difficult, for it is not an entirely objective phenomenon. It depends somewhat upon individual circumstances and personal idiosyncrasies. There are many millions of gainfully occupied persons with handicaps and chronic ailments which they do not recognize. Even if they do, they may not consider the ailments as serious or regard themselves as being so ill that they cannot continue their normal activities. Others with the same impairments may consider themselves so seriously ill as to interfere with gainful work or other ordinary activity. Economic conditions also play a part. Some may regard themselves as disabled when employment is hard to find, but return to work when jobs are plentiful.

In surveys to ascertain the prevalence of illness, the definition of illness has sometimes been broad. In such cases it may include all those whom the household informant has considered as ill, whether they have been under medical attention or not and whether the illness did or did not interfere with employment or other normal activities. On other occasions, the definition has been restricted to those confined in the home, hospital, or institution, and unable to work or follow their usual activities for a definite period of time. The difference between *disabling* illness and *all* illness, including that which is nondisabling, is thus usually marked. Consequently, in any discussion of sickness, the first point of consideration is the definition of illness.

4. How many people are unable to work or carry on their usual activities because of illness on any given day in the United States?

The number has varied from 1½ to over 5 percent of the population in the various surveys of illness made during the past 35 years. The results reflect the definition of illness, the method of gathering the data, the season of the year in which the count is made, and the emphasis placed on securing a complete record of the blind, crippled, and mental defectives, as well as the number of patients in institutions.

The general economic conditions at the time of the survey likewise affect such figures materially.

5. How does season affect the amount of illness reported?

The amount of illness varies with the season of the year in northern climates. From a high recorded in January and February, the prevalence of illness drops to a low in the late summer and then rises toward the end of the year. Seasonal variation in the amount of reported illness is mainly due to fluctuations in the amount of short-term illness; in this, the respiratory diseases are a major factor. Improved sanitation and closer supervision of milk, food, and water supplies have reduced the prevalence of the diarrheal diseases which formerly caused a secondary peak in the summer months.

6. What proportion of the population suffer no illness in the year, one illness, two illnesses, etc.?

Considering as illness all frank and recognized attacks of disease accompanied by discomfort, pain, loss of function, or disability, whether there is medical attention or not, it was found in one survey that almost one-half of the persons had no illness during the year. One illness was reported for about one-third of the group, two illnesses for one-eighth, and three illnesses for only one-twentieth. Less than one in a hundred were ill five or more times during the year. In other surveys with more complete records of minor (especially respiratory) illnesses, there were smaller proportions with no illness and larger proportions with one or more cases.

7. At what rate do cases of illness occur annually?

On the average, there is about one substantial and recognized case of illness per person each year. The exact figure, however, depends on the definition of illness used in collecting the data.

For example, in a survey made in the Eastern Health District of Baltimore in 1938 to 1939, cases of illness (incidence of illness) occur at a rate of 1.3 per person each year. In this instance, an illness was defined as any affliction or disturbance of health reported by the household informant. Defects and impairments were reported only if they were disabling.

8. How does the incidence of illness vary with sex and age?

Illnesses arise more frequently among females than males. While there is little difference in the incidence for the two sexes during the first 15 years of life, at the higher ages the rate for females exceeds that for males. The excess is greatest in the age range 20 to 24 years, but it declines thereafter with advance in age.

Beginning with a very high rate among infants, the incidence of illness drops sharply to a minimum at ages 15 to 19 years among females and 20 to 24 years among males. It then increases gradually with advance in age.

9. What proportion of all illnesses are disabling?

If we regard disability as inability to engage in the routine of normal duties or the loss of one or more days from work, school, or other usual activities, about one-half of all illnesses are disabling according to one survey. The incidence of illness disabling for one day or more is about 500 per 1,000 persons annually.

10. What is the prevalence of disabling illness, including old and new cases?

A survey conducted in February 1949 showed that 4.7 percent of those at ages 14 to 64 years were disabled on the day of the interview. Those disabled included all who, on the day of the examination, were unable to do their regular work or other duties because of illness or who had a long-term physical or mental condition that allowed them to work only occasionally or not at all.

With an additional allowance for those in institutions and for the disabled in the armed services, the prevalence rate of disabling illness for the total population at ages 14 to 64 came to 5.4 percent.

11. How much time is lost by grade school children because of sickness?

In a survey of selected schools in seven California cities during the spring term of 1947, 5.75 days per pupil were lost in absence on account of sickness. The rate might be somewhat higher in other years because only chickenpox, mumps, and whooping cough were prevalent in the period covered by the study. The extent to which the communicable diseases prevail affects school attendance materially since regulations require those with the common childhood diseases to stay at home until the period of communicability is passed.

12. Is disabling illness more common among the unemployed than the employed?

In a sickness survey made in February, 1949, it was found that 2.6 percent were disabled among those employed at ages 14 to 64; for the unemployed the rate was 5.7 percent. While lack of employment may contribute to a high illness rate, long disablement may also lead to the loss of employment. Both factors tend to increase the rate of disability among the unemployed.

13. What proportion of the disabling illnesses confine the patient to the house, to the hospital, to an institution?

According to one prewar survey, nine-tenths of those disabled were confined indoors; of these, about one-eighth were in a hospital, and less than one in 100 in some other institution.

14. What is the average number of days of disability per person each year?

The answer depends greatly on what is meant by disability. In a survey where illness was defined as any disorder which disabled an individual for one or more days or for which medical service of any kind was received, the average period of disability among all persons, whether or not disabled, was seven days during the year. However, among the disabled persons alone, the average duration was 16 days.

15. How does duration of disability vary with sex and age?

The duration of disabling illness rises with age. Among persons 25 to 64 years of age, the average duration of illness is 25 percent greater than that of younger people at ages 15 to 24; at ages 65 and over it is almost two and one-half times as great. At ages 15 to 64 years, the average duration of disability for women is somewhat less than that for men.

16. What proportion of the disability arising from illness disabling for a week or longer is due to chronic conditions?

One large-scale survey showed that out of the 9.9 days of disability per year arising from illness disabling for a week or longer, 7.3 days were due to the chronic conditions, and only 2.6 to the acute diseases.

17. How is the extent of chronic illness related to social-economic status?

In a follow-up study of families first surveyed in 1923 it was found that the prevalence of chronic diseases was much higher for the "very poor" than for the "well to do"; the prevalence for the intermediate classes was between these two extremes. It was also found that among families which had a fall in social-economic status between 1923 and 1943, the prevalence of chronic disease was almost twice that among families with an "improved" status.

18. What are the most common nondisabling illnesses?

The respiratory diseases are by far the most common cause of nondisabling illness. The minor respiratory diseases (chiefly common colds) alone cause close to one-half of all nondisabling illness. The digestive diseases and the accidental injuries, which rank second and third, each have only about one-seventh the prevalence of the respiratory diseases.

19. What are the most common disabling illnesses?

The respiratory diseases rank first among the illnesses disabling for a week or more. This large group, which includes influenza, pneumonia, coryza, tonsillitis, bronchitis, pleurisy, sinusitis, asthma, hay fever, and other diseases of the respiratory system, accounts for about three-tenths of the cases of disability lasting for seven days or more. Second in importance are the communicable diseases, while accidents rank third. The group of degenerative diseases consisting of cancer, diabetes, and the cardiovascular-renal diseases, is fourth in importance and affects approximately the same number as accidents.

20. What is the average number of days of disability for various types of illness?

In one large nation-wide survey, there were on the average 57 days of disability per year for illnesses disabling for seven days or more. Fortunately, the most common diseases cause the least disability. For the respiratory and communicable diseases, which rank first and second, the average was 23 days; for accidents, the third in rank, the average was 48 days. However, the degenerative diseases which were fourth in frequency, by their very nature, caused fairly long periods of illness, namely 122 days on the average. The longest disabilities were reported for the orthopedic impairments, 306 days; for tuberculosis, 243 days; and for the nervous and mental diseases, 190 days.

21. What percent of all illness is under the care of a doctor?

In one study where illness included all frank and recognized attacks of disease, four out of five cases received some kind of medical care, exclusive of that provided by nurses, druggists, neighbors, or other lay persons. For all cases of illness attended by a doctor, the number of calls averaged 4.2 per case.

22. What proportion of persons receive hospital care in the course of a year?

About 10 percent now receive care in general hospitals. The proportion has increased rapidly in recent years because of the increasing urbanization of our population, the rise in public demand for hospital care, the great growth in hospital insurance plans, and the increased tendency of physicians to organize their practice around hospitals where their patients can receive the help of laboratory tests, special treatments, and the constant supervision needed in their treatment.

23. What proportion of the illnesses in the care of a physician require laboratory service, X-ray service, and physiotherapy?

The use of X-ray and laboratory tests as an aid to diagnosis is now a commonplace. In a group of 6,420 hospital cases reported in 1942, 85.5 percent required laboratory service and 23.4 percent X-ray service. Other items appearing in the list of special services were physiotherapy, 1.7 percent; electrocardiography, 1.4 percent; basal metabolism, 1.8 percent; oxygen therapy, 1.4 percent; and radium therapy, 0.2 percent.

24. In what proportion of illnesses are medicines or drugs procured?

In a group of 9,000 families surveyed some years ago, medicine of some kind was procured in 58 percent of the reported cases. This was exclusive of those which were treated by home remedies or from the home stock of medicines.

The medicine was obtained on a doctor's prescription in 43 percent of the cases; on a druggist's recommendation in 3 percent; and by purchase over the counter without either a doctor's prescription or a druggist's recommendation in 12 percent of the cases.

25. How much is expended annually for medical care in the United States?

The nation as a whole spent over ten billion dollars for civilian medical and health services of all kinds in 1949. This is equivalent to about $70 per capita. *Personal* expenditures for medical and health services amounted to $7.9 billion. The generally accepted items included under *public* expenditures in the field of health and medical care by local, state, and federal governments amounted to more than two billion dollars. In addition, there were expenditures of approximately 200 million dollars for workmen's compensation and industrial medical service, as well as an amount from 150 to 200 million dollars for medical and public assistance programs.

The figures do not include medical expenditures (both health service and research) of the military establishment and the Atomic Energy Commission, nor health services provided in connection with primary and secondary education, international health activities, professional training of nurses and physicians, etc. Also excluded are expenditures for medical services and research subordinate to the performance of other functions such as those of the Department of Agriculture, the Tennessee Valley Authority, and the Civil Aeronautics Authority.

26. What is the annual cost of the medical care provided for veterans?

The Veterans Administration spent $589,000,000 in the fiscal year 1949–50 for its medical care program. This figure includes the expenses of maintaining the 136 veterans hospitals with their outpatient departments which provide medical and dental care, and the expenses of operating the general, nervous and mental, and tuberculosis hospitals, as well as the "hometown" medical program. In 1947–48, two-thirds of the days of care were for service-connected disabilities or for disabilities generally requiring care at public expense. One-third of the days of care was for nonservice connected disabilities which, though not requiring care at public expense, are treated upon affirmation of inability to defray the costs of hospitalization.

27. What does the average family spend for medical care?

While the average American family spends about 4 percent of its budget on medical care, the actual amounts spent vary widely in individual cases. Many families spend little or nothing during the year, buying only patent medicine and supplies; other families, at the same time, suffer serious illnesses, often involving very heavy expense.

In 1949, private expenditures for medical care were about $54 per capita. Physicians' services, hospital services, medicines and appliances, and laboratory fees accounted for 80 percent of the total spent. The amounts spent for the various items were as follows:

Items	Per capita expenditures
Physicians' Services	$15.37
Hospital Services	14.13
Dental Services	6.31
Nursing Services	1.40
Medicines and Appliances	12.19
Osteopathic Physicians, Chiropodists, Podiatrists, etc.	1.92
Others	2.19
Total	$53.51

28. What factors influence the amounts spent on medical care?

The amounts expended on medical care depend on the type of illness involved, and more important, on the income class of the family. According to one report, the annual expenditures for medical care varied from $28 for families with an income of less than $1,000 per year (after taxes) to $159 for families with incomes ranging from

$3,000 to $4,000. Families with incomes of $5,000 and over spent $288 for medical care in 1947.

In an earlier study, the amount spent annually for medical care by well-to-do families was ten times that in the poorest families. The size of the community also affects the cost of illness. The average annual expenditures are in general higher in large cities than in medium size cities; they are lowest in rural areas. In many cases the low expenditures by the poorest families are supplemented by services received without charge.

29. What amount is spent annually for hospital service?

In 1949, the expenditures for patient care by all nonfederal hospitals totaled $3,486,109,000; of this amount, $1,841,867,000 was spent for care by general hospitals. Expenditures for care by all federal hospitals were $764,000,000. These figures exclude expenditures for construction and for fixed equipment.

30. What change has there been in the expenditure for hospital care over the years?

The cost of hospital service today is much greater than it was even ten years ago. The average operating cost for a patient each day in voluntary nonprofit hospitals rose from $6.12 in 1939 to $14.06 in 1948. This rise was occasioned by the increase in the number and variety of services provided. In addition, wages of hospital personnel, notoriously low in the past, have risen. The cost of operating hospitals has also been affected by the higher price level of all commodities. Offsetting all this, as far as the patient is concerned, is the steady decline in the average length of the hospital stay.

31. What is the average charge for a hospitalized illness?

In one study it was found that the total cost of a hospitalized illness was about two and one-half times the amount of the hospital charge In 1949, the average income of general hospitals for each patient each day was $11.74. This is exclusive of income from gifts, endowments, or funds from special campaigns. With an average stay of 8.3 days, the average hospital charge for each patient is thus about $97, and the average cost for a hospitalized illness about $245.

32. How many people are insured against hospital expense under Blue Cross and other types of insurance?

The exact figure for the number of persons insured against hospital expenses is difficult to determine because of overlapping of the various plans. One estimate is about 75,000,000 persons.[1]

More than 37,000,000 persons are now covered by the hospital-sponsored Blue Cross. The insurance companies reported nearly 40,000,000, while other millions are enrolled for various types of hospital insurance provided by industrial medical plans, private group clinics, consumer-sponsored plans, and university health service. Quite a number of persons are insured under more than one plan.

33. What proportion of Blue Cross members are admitted to hospital care each year?

Slightly more than 12 percent of all members are admitted to hospitals annually under the Blue Cross plan. The percentage varies with sex, age, marital status, and type of contract.

34. What is the average length of hospital stay of Blue Cross patients?

In 1950, the average length of stay of Blue Cross patients in the hospital was 7.5 days. Since the end of the war the length of stay has increased somewhat; in 1944 it was 7.3 days. Children had the shortest stay in 1944, namely, 4.56 days; the longest stay, 9.60 days, was incurred by adult females from families of two members. Single males and females and mothers stayed an average of about 9 days, while fathers stayed 7.7 days.

35. What proportions of hospitals are proprietary, private nonprofit, and governmental?

The largest number of hospitals in the United States in 1950 was in the nonprofit group. Out of a total of 6,430 hospitals registered by the American Medical Association, 3,169 were church and other nonprofit hospitals; the state, county, and city hospitals numbered 1,557, and federal hospitals, 355. There were 1,349 proprietary hospitals.

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[1] See answer to Question 46 of this Chapter, page 93.

The several categories of hospitals differ in their number of beds, bassinets, admissions, and average census. On these bases, the classes of hospitals were distributed as follows in 1950 (total = 100%):

Type of Hospital	Hospitals	Beds	Bassinets	Admissions	Average Census
Total	100.0	100.0	100.0	100.0	100.0
Federal	5.5	12.8	2.7	6.6	11.7
Governmental, nonfederal	24.2	58.4	15.9	18.8	63.2
Private nonprofit	49.3	25.3	71.5	66.1	22.4
Proprietary	21.0	3.5	9.9	8.5	2.7

36. Under what auspices do general hospitals operate?

Private voluntary agencies maintain about four-fifths of the general hospitals. These furnish most of the facilities for acute illnesses. The government customarily assumes responsibility for the care of patients suffering from tuberculosis, and nervous and mental disorders requiring long hospitalization. In addition, the federal government looks after veterans in certain circumstances, all military personnel, and some of the dependents of the latter.

37. What variation is there in hospital facilities among states?

The 6,430 registered hospitals in the United States in 1950 had a capacity of 1,456,912 beds. This amounts to an average of approximately 9.6 beds per 1,000 population, including the armed forces; there were 9.4 beds per 1,000 civilian population.

There is wide variation in the distribution of these hospital facilities among states. The District of Columbia had a high of 19.7 beds per 1,000 population while New Mexico had a low of 5.9 per 1,000. The location of large federal facilities in certain of the states accounts for part of the variation, but some of it reflects the relative wealth of the states. The Southern states have the fewest hospital beds per capita.

38. How many general hospital beds are there per 1,000 population?

In 1950, there were 587,917 beds, or about four per 1,000 population, in general hospitals in the United States. Of these, 108,479, or nearly one-fifth, were in federal hospitals. Many patients in the hospitals of the U. S. Public Health Service, the Veterans Administration, Indian Affairs, and even some of those in the hospitals of the Army, Navy, and Air Force are from the civilian population. In 1950, the average number of beds in general hospitals, including the federal, ranged from 8.6 per 1,000 population in the District of Columbia to only 2.2 in Alabama and Mississippi. California had an average of 4.6; New York, 4.4; Pennsylvania, 4.2; and Illinois, 4.1.

39. What provisions have been made in recent years to correct the shortage of hospitals in some areas of the country?

In 1946, Congress authorized the appropriation of $75,000,000 each year for five years to be granted to states on a matching basis for the construction of hospitals. The federal government under certain conditions was to bear one-third of the cost of constructing and equipping of nonprofit hospitals and public health centers as well as of the addition to existing facilities or their replacement. In 1949, Congress extended this hospital construction program, with some modification, to June 30, 1955.

By mid-1951, the government had approved over a billion dollars worth of hospital and health center construction. This includes the funds provided by the states, local communities, and private organizations, as well as those provided by federal grants.

40. How many physicians are there in the United States?

In 1949, the number of licensed physicians in the United States was 201,277. One-fourth of them are classified as specialists. The number of physicians engaged in "rendering medical services directly to the civilian population" is 150,417, of whom 95,526 are general practitioners and the remainder full-time specialists. An additional 29,000 doctors, internes, and residents are in full-time hospital service, in industrial medicine, and so forth.

In the United States, doctors average one to each 741 persons in the population. Considering only those in active private practice, there is one physician to 982 persons. As might be expected, the larger cities with their better medical facilities and higher economic incentives attract more doctors, while the rural areas have a much lower ratio of physicians to persons.

41. How many medical schools are there, what is the number of students, and how many are graduated each year?

The total enrollment, excluding students taking a required interne year, in the 72 medical schools and seven basic medical science schools in the United States was 25,103 for the year 1949–50. There were 5,553 graduates.

42. How many registered nurses are there in the United States and in what types of service are they?

In the spring of 1949 there were 506,050 professional registered nurses in the United States and Territories. Of this number, 59 percent were actively engaged in nursing. The largest proportion of active nurses was employed in hospitals or other institutions; the second-largest group was engaged in private practice. The distribution of active professional registered nurses by the fields of nursing was as follows in 1949:

Field of Nursing	Number	Percent
Total in active practice	300,533	100.0
Hospital and other institution	141,882	47.2
School of nursing	7,839	2.6
Hospital and school of nursing *	4,044	1.3
Public health	28,930	9.6
Public health and school of nursing *	272	.1
Private duty	65,032	21.6
Industrial	13,113	4.4
Office	26,444	8.8
Other and unclassified	12,977	4.4

* Divide time between teaching and hospital or public health duties

43. How many schools of nursing are there, what is the number of students and how many graduates are there each year?

At the beginning of 1950, there were 1,190 state-accredited schools of nursing with 97,903 students. The number of students graduated each year increased steadily from 23,600 in 1940 to 40,744 in 1947. Because of the decline in admissions following the end of the war, the number graduated dropped sharply in 1949 to 21,379. However, in 1949 the schools of nursing admitted 43,612 first-year students, the largest class in any peacetime year.

44. How many practical nurses are there in the United States?

The exact number of practical nurses is not known. At the time of the 1940 census there were 190,000 practical nurses and attendants. There has been a large increase since that time, however. Practical nurses and attendants care for patients in their homes or in hospitals or institutions. They perform a combination of housekeeping and nursing duties, applying knowledge acquired primarily through practical experience. By 1949, 27 states provided for the licensing of practical nurses. However, with the exception of Arkansas, the laws were permissive and not compulsory.

45. How many dentists are there in the United States?

Dentistry is a relatively new profession, and the number which have been graduated by the dental schools in this country up until 1949 total less than 130,000. Today there are approximately 87,000 dentists.

There are 41 dental schools. The number of freshmen accepted annually in all schools is about 3,000.

46. How many people are insured against cost of sickness under various plans?

It is estimated that about 75,000,000 persons in the United States were insured for hospital expenses under voluntary plans by 1951; this includes heads of families and their dependents.[2] One year prior, over 41,000,000 were insured for surgical expenses, about 17,000,000 for medical expenses, and over 34,000,000 were protected by voluntary disability insurance against loss of income. These numbers have grown rapidly since World War II.

47. In how many states are there voluntary prepayment medical care programs?

By March 31, 1950, 40 states and the District of Columbia had plans which were actually enrolling subscribers; the enrollment was 14,600,000. In the remaining states, plans were under consideration or in the process of organization.

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[2] See answer to Question 32 of this Chapter, page 89.

48. How many states provide insurance against disability?

Rhode Island, California, New Jersey, and New York have insurance plans against nonoccupational disability. Rhode Island, where operations began in 1943, has a cash sickness compensation plan, wholly compulsory with the state as the insurer. The California plan, which began payments December 1, 1946, provides for a state unemployment insurance disability fund, but voluntary plans, either through self-insurance, benefit associations, or commercial insurance companies, are also allowed. In New Jersey, where benefits became payable January 1, 1949, there is a state disability fund with provisions for contracting insurance privately outside of it. The New York plan, with payments beginning July 1, 1950, permits self-insurance or insurance with authorized commercial companies; it also has a State insurance fund.[3]

49. What types of disability insurance are provided under social insurance and related programs?

Disability payments are provided under the Veterans Administration program, the Railroad Retirement Board, and various local, state, and federal governmental plans.

Assistance to the needy totally and permanently disabled is provided in the 1950 amendment to the Social Security Act. This program will be started and administered by the states, but financed, in part, by the federal government.

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[3] See answer to Question 45 of Chapter XVIII, page 289.

VII

MORTALITY—IN GENERAL

1. How many people die in the world annually?

The number of deaths in the world may fluctuate widely from one year to the next, depending upon the presence of epidemic or famine in the poorly developed areas. A rough estimate of the annual number of deaths is 62,500,000, or two every second. About two-thirds of these deaths are in Asia, somewhat less than one-sixth in Europe, about one-tenth in Africa, and one-twelfth in the Western Hemisphere.

2. What purposes are served by the mortality records of a community?

Mortality records are essential for the planning and effective operation of a community's medical and health services. Properly analyzed, these records point to the need for specific health services and facilities of various types, for example, hospital beds, health centers, clinics of various kinds, and specialist services. Statistics on fatal accidents guide the direction of safety campaigns. They indicate the degree of hazard in specific occupations, the causes of automobile fatalities, and even the dangers in the home. The success of specific programs for the control of disease or fatal accident can be evaluated by mortality records. Such records are also of great service in medical research.

3. How is the mortality of the community measured?

The mortality of a community is measured by its death rate. This is obtained by dividing the number of deaths in a period of time, say a year, by the average population living during the year. For example, in 1940 there were recorded 1,417,269 deaths in the United States. The population living on July 1, 1940 was 131,954,000; this may be regarded as the average for the year. Dividing 1,417,269 by 131,954,000 yields .0107; multiplying this result by 1,000 gives a death rate of 10.7 per 1,000 population. This is called the "crude" death rate because it applies to the total population without consideration to the composition of the population by age, sex, or other characteristics.

4. What is the mortality in the United States today?

The crude death rate for the United States in 1950 was 9.6 deaths per 1,000 population, the lowest it has ever been. The death rate for 1950 was 1 percent below that for the year before and 10 percent under the figure for 1940.

5. How does mortality vary from age to age?

A death rate for a specific age may be computed by dividing the annual number of deaths in the community at that age by the number of persons at the same age and multiplying the result by 1,000. In this way it is possible to secure death rates or mortality rates at the various ages of life. Mortality is high among infants, especially during the first month of life.[1] The rate then drops sharply as the infant goes into childhood, and remains at a rather low level throughout adolescence. The mortality then increases with advance in age, first gradually and after about age 40 more rapidly. It is not until near age 65 that the mortality rate is again as high as in the first year of life. At age 85, the mortality rate is more than double that at age 65.

6. At what year of age is the number of deaths greatest?

The number of deaths is greatest in the first year after birth. In 1948, there were 113,169 infant deaths reported in the United States. This was more than the number for ages 1 through 34 years inclusive. A secondary peak in the number of deaths occurs near age 72.

7. What is the safest age from the standpoint of mortality?

Age 10 is the safest year of life. Children of that age have passed the hazards of the acute infections of infancy and early childhood. They have yet to face the chronic diseases of the later years. Among children 10 years of age, accidents constitute the most frequent cause of death.

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[1] See Chapter XIV, page 212.

8. What is the relation between mortality and longevity?

In a sense it might be said that longevity is the inverse of mortality. Generally speaking, where differences in death rate are large, one may be rather sure that there will also be large differences in longevity However, the relation between mortality, as measured by the crude death rate, and longevity, as measured by expectation of life at birth, is quite complex. It is usually not safe to infer that of two communities which show a small difference in their crude death rates, the one with the lower rate will have the greater longevity. It is necessary to know the mortality rate at various ages of life to be able to measure longevity or the expectation of life of a community or of a group of people. This calls for the construction of what is known as a "life table." [2]

9. How does the mortality of men differ from that of women?

Men have a higher mortality than women at every year of age. In the first year of life the mortality of white males was about one-third higher than that for white females in 1946–48. The ratio of male to female mortality rises to almost 2 near age 21 and then falls to a low point of about 1.4 at age 35. Another peak in the ratio of male to female mortality, about 1.8, is reached near age 55, and from that point on the ratio diminishes steadily with advance in age. The higher mortality of males, as compared with females, has been found in most species of animals as well as man. (See Chart 7.)

10. What difficulties are there in international comparisons of mortality?

Two main problems arise in comparing crude death rates for different countries. First, many deaths in underdeveloped countries may not enter into the reports because of an inefficient system of registration, while the reporting of deaths is fairly complete in the more developed countries. The second difficulty arises from the fact that the crude death rate is strongly influenced by the age and sex distribution of the population; countries can differ greatly in this regard. A country with a young population will have relatively few deaths because most of its people have not yet reached the ages at which diseases take their greatest toll. Its crude death rate will, therefore, tend to be low. On the other hand, in a nation with a large proportion of aged in its population, the high mortality of the aged will predominate in the total picture and the crude death rate will tend to be high.

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[2] See answer to Question 12 of Chapter XXIV, page 392.

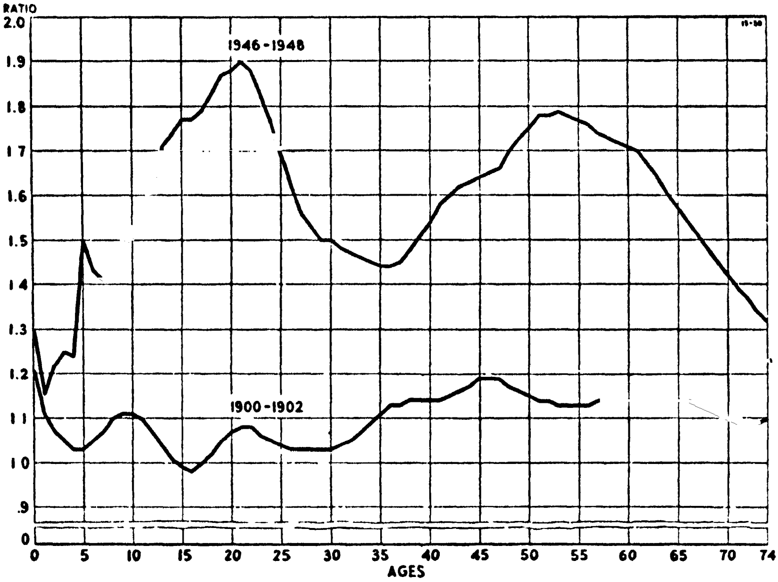

Chart 7. Ratio of mortality rates at each age, white males to white females, United States 1900–1902 (Original Registration States) and 1946–1948.

11. How does mortality in the United States compare with that of other countries?

The United States is among the nations having the lowest death rates. The principal nations having somewhat lower death rates are Canada, New Zealand, Australia, the Union of South Africa, the Scandinavian countries, The Netherlands, and Israel. Most of the countries with the highest death rates are in South America and Asia. The differences in death rates between the leaders and the underdeveloped countries would be even greater if account could be taken of the unreported deaths in many of the latter group. A further qualification in the comparison, as indicated in Question 10, arises from the differences in the age constitution of the populations in the various countries.

12. Which country has the lowest death rate at the present time?

The Jewish population of Israel reported a crude death rate of only 6.8 per 1,000 population in 1949, lower than that for any other country in the same year. In this case we have a good example of the influence that a favorable age distribution of the population has upon the crude death rate. The low crude death rate for the Jews in Israel reflects the low average age of that country's population, a result of the recent influx of young immigrants. The crude death rate is not a good measure of their mortality. For a truer measure of the mortality of Israel in relation to other nations, it would be necessary to compare death rates among them at different ages of life.

13. How are the difficulties of international comparison of mortality minimized?

It is entirely possible for two nations to have practically identical death rates at the various ages of life and yet have markedly different crude death rates. Such a situation would arise if one of the nations had a larger proportion of aged than the other. In order to obtain a better index of mortality for purposes of comparison, the death rates are "age-adjusted." The procedure is, first, to take some common age distribution of the population as a standard. In this standard population we then find the expected number of deaths by multiplying the number of people at each age by the corresponding death rate for that age in the nation in question. The sum of expected deaths for each age computed in this way, when divided by the total population of the standard, yields the age-adjusted death rate. It will be recognized that two nations having practically identical death rates at each stage of life will also have practically identical age-adjusted death rates.

14. How do urban and rural areas compare in mortality?

In general, mortality is lower in rural areas than in urban centers. In 1910, the age-adjusted death rate for cities was one-sixth higher than for rural areas. Among all urban centers, mortality was most favorable in cities from 10,000 to 100,000 population. Cities of 100,000 or more had a lower death rate than communities of under 10,000. In some small degree, the higher mortality in urban centers may be due to the movement of sick persons away from the country to cities where medical attention is more easily available. There is also the possibility that the reporting of deaths in cities is more complete than in rural areas.

15. How do the states rank as to mortality?

The states with the most favorable mortality are in the Midwest. These include the Dakotas, Nebraska, Iowa, Kansas, Minnesota, Wisconsin, and Oklahoma. Most of the states with the highest mortality are in the South. In general, the best mortality records are found in the relatively rural states with predominantly white populations. States with large colored populations, and with many cities and industrial areas, show the higher death rates. In a few places, for example Arizona and Colorado, the death rates may be influenced by the high mortality of people who take up residence there because of ill-health

16. What difference is there in the mortality of the white and nonwhite populations of the United States?

The mortality of the nonwhite population is considerably higher than that of the white. In 1940, the age-adjusted death rate of white persons was 10.2 per 1,000, while that for Negroes was 16.5. American Indians had an age-adjusted death rate of 14.9 and the Chinese, 14.7 per 1,000.

17. How does the mortality of the married differ from that of the single, widowed, or divorced?

Among both men and women, the married have lower death rates than the single, widowed, or divorced. However, the differences are greater for men than for women. In 1940, the age-adjusted death rate for single men was one and one-half times that for the married men. The widowers had a death rate twice that for the married men, while the divorced had a ratio of over twice the married. Among women, the single had a death rate only 10 percent higher than that for the married. However, the death rate of widowed and divorced women was over one and one-half times that for married women. The advantage for married women is now found even at the principal childbearing ages, 20 to 29. Formerly this was not the case, owing to the high maternal mortality which once prevailed.[3]

18. How does the mortality of the native-born compare with that of the foreign-born?

In 1900, the mortality of the foreign-born was about one-fifth greater than for the native-born, but the differential has since been eliminated. The excess of mortality among the foreign-born was generally attributed to the substandard living conditions of immigrants. Many of them lived in crowded slum sections of cities under poor sanitary and working conditions. Today, the new arrival in this country no longer faces the great handicaps of those who came here years ago. The early immigrants are now largely in the older age groups and have used their opportunity to become acclimated and well-established in this country. They have benefited greatly with the rest of the population from improved surroundings and higher standards of living.

19. Has occupation any relation to mortality? [4]

Occupation may affect mortality both directly and indirectly. Men in certain types of work—steeplejacks, structural iron workers, and electrical power linemen, for example—have unusually high accident rates. Some other workers are exposed to dust, abnormal temperatures, or chemicals which may result in a high mortality from certain diseases or conditions. In addition to these direct effects, occupation may also have an indirect influence on mortality through the standard of living which results therefrom. The relatively low income of unskilled laborers may mean inadequate food, crowded and unhealthful living quarters, and the need to work during periods of sickness.

20. How does mortality in the world today compare with that of ancient times?

Fossil remains indicate that prehistoric man seldom achieved old age. Death by violence was very frequent. Mortality in infancy must have been extremely high in ancient times, even in the best period of Greece and Rome. Deaths might easily have been at the rate of 50 per 1,000 persons each year. The corresponding rate for the more advanced countries today is one-fifth as high.

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[3] See answer to Question 14 of Chapter IV, page 53.

[4] See Chapter XVIII, page 272.

21. What has been the trend of mortality in the last century?

The death rate in the United States during the last century has declined very rapidly. Although the public health movement had its start about 100 years ago, preventive medicine did not make real headway until the turn of the century. In Massachusetts, the only state with 100 years of good health records, mortality from tuberculosis has been cut by more than 90 percent, infant mortality by almost as much, and mortality from pneumonia by more than two-thirds. Since 1900 alone, the death rate for all causes of death in the United States has been cut by more than 40 percent. Typhoid fever, diphtheria, measles, scarlet fever, whooping cough, and smallpox have been virtually eradicated as causes of death.

22. What are some of the principal factors in the recent improvement in mortality?

Fundamentally, the great reduction in mortality during our time is a result of the great advances in medical science, in public health practice, and more generally, in our standard of living. By eliminating foci of infection, by broad scale immunizations, and by more effective medical care, it has been possible to alter greatly the picture which prevailed at the beginning of the century. At that time the first three leading causes of death were the infectious conditions, namely pneumonia and influenza, tuberculosis, and diarrhea and enteritis. Diphtheria ranked ninth and meningitis, tenth. Today, pneumonia and influenza rank only sixth, followed by tuberculosis in seventh place. Diarrhea and enteritis are now of minor importance as causes of death, while diphtheria and meningitis are practically out of the mortality tables. For most of the great reductions in mortality it is possible to point to some specific advance in medicine and sanitation. We should not, however, overlook the contribution from our rising standard of living which has given us better food, improved surroundings in our home and place of work, a shorter work day, and more opportunity for healthful recreation. These improvements have undoubtedly strengthened our resistance against many diseases.[5]

23. At which ages has the reduction in mortality been greatest?

Mortality has been reduced most rapidly in infancy and early childhood. There have also been sharp decreases in death rates up through middle life; even the higher ages through 65 years have shown substantial reductions. For example, mortality in infancy among white females is now less than one-fourth of what it was at the beginning of the century. At age 30, current mortality is only one-sixth of that in 1900. Even at age 50 the death rate for white females today is appreciably less than one-half that at the beginning of the century and at age 70, the reduction comes to one-third. Contrary to general impression, improvement in mortality is observed even at the older ages.

24. How does the reduction in mortality of men compare with that of women?

Quite generally, the reduction in the mortality for women has been greater than for men. At age 30, for example, the mortality for white males in 1948 was one-fourth of that in 1900, whereas for white females the ratio was one-sixth. At age 70, the recent mortality rate for white males was nine-tenths of that at the beginning of the century, but for white females the ratio was a little over two-thirds. In infancy both sexes experienced about the same rate of improvement.

25. How does the reduction in mortality of the white compare with the nonwhite populations?

During the last two decades the death rates for the nonwhite population have been declining more rapidly than for the white population. For example, from the period 1929–33 to 1944–48, the decline in the death rates for the nonwhites amounted to 30 percent, compared with 22½ percent for the white population. The more favorable showing for the nonwhites reflects their more rapid improvement in living conditions. However, there is still an appreciable difference in the mortality of the two groups, the death rate for the nonwhite population in 1948 being 50 percent higher than for the white population.

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[5] See answer to Question 9 of Chapter XXIV, page 390.

26. How many lives are saved annually because of the reduction in mortality since 1900?

If the mortality rates of 1900 had prevailed in the population in 1950, there would have been about 3,100,000 deaths. Instead, there actually were 1,456,000 deaths. In other words, 1,694,000 lives were saved from premature death in that one year as a result of the improvement in mortality conditions during the past 50 years

27. What are the common causes of death today?

Diseases of the heart rank first as causes of death, accounting currently for practically one third of all deaths Cancer, with almost one seventh of all deaths, ranks second Next in order is cerebral hemorrhage, to which is ascribed about one-tenth of all the deaths Accidents are the cause of about one sixteenth of the total deaths The causes of death following in order are nephritis, pneumonia and influenza, tuberculosis, premature birth, diabetes, and arteriosclerosis These first ten leading causes of death constitute 82 percent of the total

28. What changes in rank have the leading causes of death shown since the turn of the century?

These changes are evident in the table on page 105

29. How have the chances of eventually dying of an acute or chronic disease changed since the beginning of the century?

With the great reduction in mortality from the infectious conditions, the chances of dying from an acute disease have declined sharply. In 1901, these chances were somewhat greater than one in three for the newly born baby By 1945, the chances of eventually dying from an acute condition had declined to only one in ten. Since death is a certainty, there has been, contrariwise, a sharp rise in the chances of eventually dying from a chronic disease. These chances were one in two for the baby born in 1901, but they have risen to about four in five for the present-day baby There has been relatively little change in the chances of eventually dying from external causes during this period (See Chart 8 on page 106.)

The Ten Leading Causes of Death in the United States, 1900 and 1948

Rank	Cause of Death	Death rate per 100,000 population	Per cent of deaths from all causes
	1948		
	All Causes	989	100.0
1	Diseases of heart	323	32.7
2	Cancer	135	13.7
3	Cerebral hemorrhage	90	9.1
4	Accidents	67	6.8
5	Nephritis	53	5.4
6	Pneumonia and influenza	39	3.9
7	Tuberculosis	30	3.0
8	Premature birth	27	2.7
9	Diabetes mellitus	26	2.6
10	Arteriosclerosis	19	1.9
	First ten causes	809	81.8
	1900		
	All Causes	1,719	100.0
1	Pneumonia and influenza	202	11.8
2	Tuberculosis	194	11.3
3	Diarrhea and enteritis	143	8.3
4	Diseases of heart	137	8.0
5	Cerebral hemorrhage	107	6.2
6	Nephritis	89	5.2
7	Accidents	72	4.2
8	Cancer	64	3.7
9	Diphtheria	40	2.3
10	Meningitis	34	2.0
	First ten causes	1,082	63.0

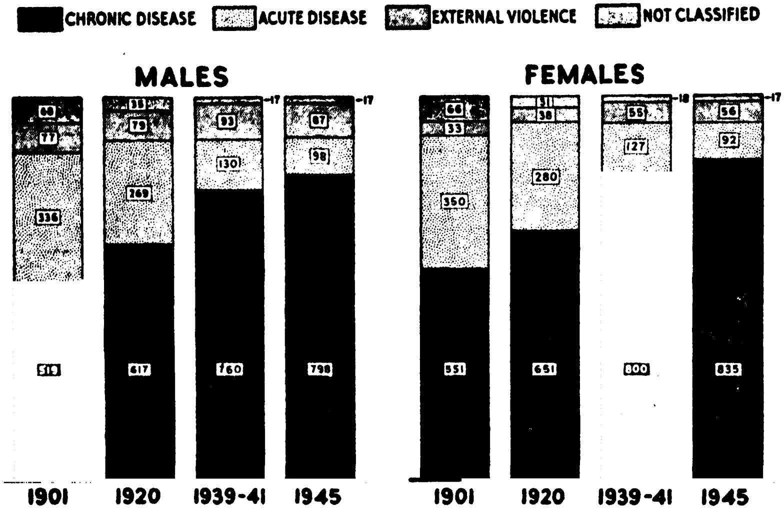

Chart 8. Chances per 1,000 at birth of eventually dying from chronic disease, acute disease, or external violence, United States, 1901, 1920, 1939–1941, and 1945.

30. What factors account for the sharp drop in mortality from the infectious diseases?

The control of these diseases has resulted from efforts on three fronts. First came the discovery of the manner by which the diseases were spread and their causative organisms. Next in importance were the intensive campaigns carried on by public and voluntary health agencies to prevent infection by blocking the transmission of the diseases. Finally, there were the techniques used for building up immunity. The advances along these lines were made possible by the efforts of the medical profession, public health authorities, scientific workers in many fields, and the cooperation of the general public.

The control of typhoid fever, for example, followed the development of sewage disposal systems, the purification of water, the protection of milk supplies, the elimination of insect carriers, the supervision of human carriers and, finally, the more general use of inoculation. In the case of yellow fever, the turning point came when Walter Reed demonstrated that the disease was transmitted by the mosquito.

Extensive measures to eradicate it came soon after. Diarrhea and enteritis were brought under control by the general improvement in sanitary conditions and by the protection of food supplies, particularly through the pasteurization of milk.

31. What recent developments in medical science have sharply reduced mortality?

The treatment of many acute conditions has been revolutionized by the development of specific serums, by chemotherapy, and by antibiotics. A good example of the beneficial effects of these new treatments is provided by the trend of mortality from pneumonia. The introduction of serum treatment about 1935 brought down the death rate from this disease shortly thereafter. After the sulfa drugs were introduced about 1937, mortality again dropped, but this time somewhat more rapidly. A major decline in the death rate was brought about since World War II through the introduction of penicillin and other antibiotics. Among other conditions brought under control through these new developments is sepsis, as a result of which the chances of recovery in surgical operations have greatly improved.

32. What are the leading causes of death at the various ages of life?

The leading causes of death change dramatically with advance in age. In infancy, morbid conditions associated with birth take the largest toll. For children under one year of age, the leading causes of death in order of importance are premature birth, congenital malformations, pneumonia and influenza, injury at birth, and diarrhea and enteritis. In early childhood, accidents are the greatest danger, and the infectious conditions lead the natural causes. For example, at ages 1–14, the chief killer is accidents, followed by pneumonia and influenza. Even at this early age, diseases of the heart and cancer enter the mortality picture; tuberculosis also ranks relatively high. Accidents continue as the leading cause of death at ages 15 to 24 years, followed in turn by tuberculosis and diseases of the heart. Beginning with age 25, the lead among the causes of death is held by diseases of the heart. Accidents hold second place at ages 25 through 44, followed closely by cancer and tuberculosis. After age 45, cancer holds second rank among the causes of death, cerebral hemorrhage third, and nephritis fourth.

33. What are the prospects for still further improvement in mortality?

With the continued advance of medical science and of public health work, there will undoubtedly be further sharp reductions in maternal mortality, infant mortality, and from such infections as pneumonia and tuberculosis and, finally, in accident fatalities. The increasing concentration of research and medical facilities on the diseases of the cardiovascular-renal system and on cancer will undoubtedly bring improvement in these directions.

34. What was the effect of World War I on mortality in the United States?

War deaths were but a small fraction of the total deaths for the United States in the years of World War I. The direct battle losses among members of the Army, Navy, and Marine Corps came to 52,692 deaths. Nonbattle deaths in the armed forces, chiefly from the influenza epidemic, totaled 55,868. During this period, the annual number of deaths for the country was about 1,000,000.

35. What was the effect of World War II on mortality in the United States?

The loss from battle deaths among members of the armed forces during World War II was about 300,000. Nonbattle deaths came to approximately 110,000. There was amazingly low mortality from disease among the armed forces, but on the other hand, the record for nonbattle fatalities was high. Almost half of the nonbattle fatalities were the result of aviation accidents. The civilian population of the United States experienced a very favorable death rate during the war years; the intensified efforts by government and by voluntary health agencies to preserve the public health were undoubtedly factors in this development. The acceleration of medical research during the war also had some beneficial effect. In 1946, the first postwar year, the death rate was down to 10 per 1,000, the lowest recorded for the country up to that time.

36. How does mortality vary with the seasons?

Mortality is highest in January and February, and lowest in July, August, and September. In 1948, for example, when the crude death rate for the entire year was 9.9 deaths per 1,000 population, the winter high of 11.2 occurred in January and the summer low of 8.8 came in September. Most of the seasonal fluctuation in mortality is the result of the seasonal changes in the respiratory diseases, particularly influenza and pneumonia. Heart disease shows some seasonal variation, partly because heart patients not infrequently succumb to pneumonia. In many diseases, such as tuberculosis and cancer and those associated with childbirth, there is relatively little seasonal influence on mortality.

37. What has been the effect of decreasing mortality on population growth?

The decline in mortality since the industrial revolution has resulted in a rapid increase in the population of the world. From 1800 to 1936, just before World War II, the population doubled. Mortality reduction was concentrated, for the most part, in the countries of the Western world. More attention is now being given to the control of disease in the less developed areas of the world, and population increase will continue on a large scale if present birth rates are maintained.

38. What has been the effect of decreasing mortality on the age distribution of the population?

The rapid decrease in mortality has been one of the factors contributing to the aging of our population. The other two factors are the reduction in the birth rate prior to World War II and the curtailment of immigration. The decline in mortality, which has been concentrated largely before midlife, has increased the chances of survival to the older ages. According to health conditions prevailing in 1900, the chances of surviving from birth to age 65 were 41 in 100. In 1948, these chances were 66 in 100.

39. Does heredity or environment have the greater effect on mortality?

The changes in environment brought about by our rising standard of living and the advances in public health administration, in addition to the progress of medicine, have profoundly affected our mortality experience. Compared with the reduction in death rates produced by these forces, the differences in mortality observed between groups with long-lived parents and groups with short-lived parents are relatively minor.

40. Which diseases are holding back progress of underdeveloped areas? [6]

Malaria saps the energies and abilities of many millions of people in these areas. It is estimated that hundreds of millions suffer from the disease and that between two and three million a year die from it. Malaria is particularly prevalent in hot countries, and infests many of the most densely populated areas of the world.

Tuberculosis and the venereal diseases also cost millions of lives annually and are a constant drain on the energies of many nations. Tuberculosis is a serious problem in many countries where industrialization has already taken place, as well as in underdeveloped regions. Venereal disease is estimated to affect half of the population in some areas of East Africa, about one-third of those in the Northeastern provinces of China, and about one-eighth of the people in some sections of India.

Among the nutritional diseases that are debilitating are beriberi, pellagra, and scurvy. All of these are common in various areas of Asia.

41. What are the principal epidemic diseases still in the world? [6]

None of the principal epidemic diseases has been completely eradicated. They continue to crop up in different places, usually where health conditions are still poor. Perhaps the most dangerous one—because there is not yet any effective way to prevent it—is influenza. As recently as the winter of 1950–51, a wave of influenza swept England. Cholera, plague, typhus, yellow fever, and smallpox are still reported in many countries. There are practical ways of inducing immunity to all of these infections and of controlling the insect and other hosts which spread them. These public health measures, however, are seldom applied in the less well developed and poorer areas of the world except when the diseases flare up into epidemics. Even then, the outbreaks must usually be fought with the aid of supplies and often with personnel from Europe or North America.

[6] See also Chapter XXI, on page 331.

42. What effect will rapid declines in mortality have on the future of underdeveloped countries?

Recent demonstrations have shown that expert medical and public health workers with a moderate expenditure of funds can practically eliminate certain of the infectious diseases. In Ceylon, for example, an island-wide antimosquito campaign, conducted by only 1,000 workers using DDT, was so effective that within a few years the total mortality was cut one-third. Dramatic results have also been recorded in other areas, notably in Greece and Sardinia. In practically all of the underdeveloped countries that have benefited from rapid declines in mortality, birth rates have remained at a high level. This means that the crude rate of natural increase, the difference between the birth rate and the death rate, will move upward rapidly. These countries, most of which are subject to great population pressure, may thus have this pressure increased. A solution is being sought by helping them to expand their agriculture and industry, by encouraging migration to newly opened areas, and by spreading knowledge of birth control.

43. How are international relations affected by the existing reservoirs of high mortality?

High mortality is not only a frequent result of a low standard of living, but is also often the cause of it. In many underdeveloped areas, living conditions are appalling because malaria and other diseases impose a heavy burden on the people. They are poor and lack the resources in trained personnel and equipment to cope with the most common infectious conditions. Present efforts to promote public health work in the East will unquestionably strengthen many of these nations and make them more influential in international relations. The dissatisfaction with recent health conditions on the part of many people is only a part of a more general situation which has recently received the attention of the United Nations and of our own country in its Point Four and other programs.

44. What international agencies exist to combat high mortality?

Although large-scale active efforts toward world-wide eradication of disease are relatively new, there have been organizations interested in international public health for many years. The International Red Cross, which is now nearly 90 years old, and many national Red Cross organizations dating back a number of decades have been engaged in health work transcending national boundaries. The Pan American Sanitary Organization was started in 1902. The Health Organization of the League of Nations came after the first World War. Many private charities have also had international activities for years. The International Health Division of the Rockefeller Foundation, for example, antedates World War I.

Since World War II, the Pan American Sanitary Organization, the Health Organization of the League of Nations, and the International Office of Public Health have been absorbed by the World Health Organization of the United Nations. W.H.O membership, which is open to any nation in the world has 78 member countries At present its primary aim is the reduction of mortality from malaria, tuberculosis, and venereal disease in all parts of the world, but particularly in the underdeveloped nations. Teams of W.H.O. experts are now working in Africa, Asia, and Europe to control disease-carrying mosquitoes, to test populations for tuberculosis, to administer antituberculosis BCG serum, and to use drug treatments for venereal disease.

W.H.O. also has an epidemiological section with a chain of stations for reporting outbreaks of epidemic disease. When cholera erupted in Egypt in 1947, the W.H.O. Interim Commission mobilized the world's resources for producing vaccine and ended the epidemic in record time. In 1949, when there was an outbreak of typhus in Afghanistan, it was the W.H.O. again which arranged for shipments of antityphus vaccine and of DDT to kill the lice which spread the infection.

VIII

THE CONQUEST OF TUBERCULOSIS

1. What is the annual death toll from tuberculosis in the United States?

Tuberculosis currently accounts for about 35,000 deaths a year in this country, or for less than 3 percent of the total mortality. The death rate from the disease is currently about 23 per 100,000 population, which still places tuberculosis high among the health problems of the nation. One and one-tenth times as many persons now die of tuberculosis as are killed in automobile accidents, and about 20 times as many as succumb to poliomyelitis. The death toll alone, however, is an inadequate measure of the social and economic loss which the disease still inflicts upon the individual, his family, and the community. As a chronic disease, tuberculosis often entails considerable medical and hospital costs as well as loss of income over many years.

2. How does tuberculosis rank among the causes of death?

Tuberculosis is now in seventh place among the causes of death, being outranked by heart disease, cancer, cerebral hemorrhage, accidents, kidney ailments, and pneumonia. Only 50 years ago tuberculosis was the second-ranking cause of death and a common cause of misery and destitution among American families.[1] Social and economic progress, public health work, and the extension and improvement of medical care have helped to bring about this extraordinary improvement in the tuberculosis situation.

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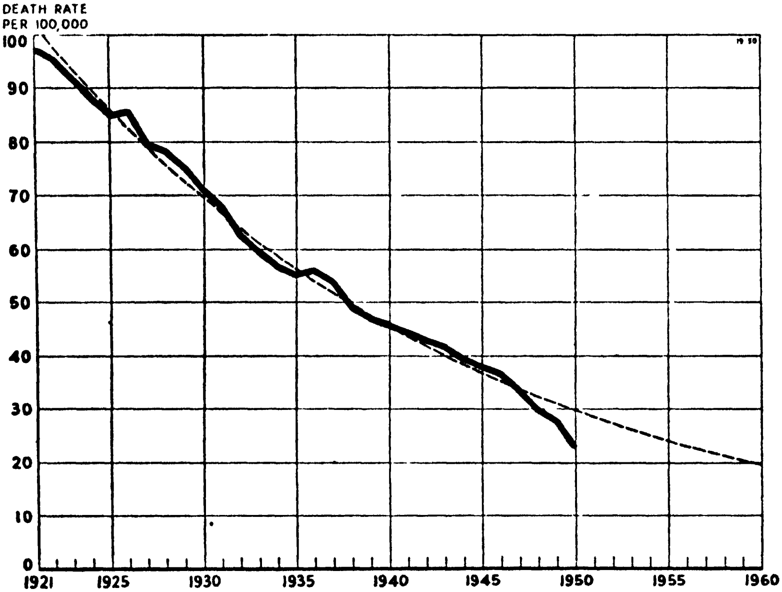
[1] See answer to Question 28 of Chapter VII, page 103

3. What has been the trend of mortality from tuberculosis?

The decline in the death rate from tuberculosis is one of the outstanding achievements of public health work in the United States. Since 1900, when the death rate from tuberculosis was 194 per 100,000 population, the decline has been almost continuous. By 1940, the death rate from the disease was down to 46 per 100,000. In the decade following, the death rate has fallen 40 percent. Its recent history has been marked by an acceleration in the rate of decline. (See Chart 9.)



*Expanding Death Registration States

Chart 9. Decline in tuberculosis mortality in the United States.

4. What does the decline in the tuberculosis rate since 1900 mean in number of lives saved?

If the 1900 death rate from tuberculosis at various ages had continued to the present time, the annual number of deaths from the disease in our population of 153,000,000 would be about 300,000. Instead of that, only about 35,000 deaths occurred in 1950. That represents a saving of about 265,000 lives in that year alone.

5. What is tuberculosis?

Tuberculosis is an infectious disease caused by the tubercle bacillus. It is communicable, and is spread by those with active disease. Externally noticeable symptoms do not usually appear until the disease is well advanced; detection is best accomplished by X ray examination of the chest. Although characteristically a chronic disease, tuberculosis may occur in acute form, causing death within a few months. Among infants, the disease is particularly likely to develop rapidly in the form of generalized tuberculosis.

6. Can a person be infected with tuberculosis but not come down with the disease?

Millions of Americans have been infected with tuberculosis but have not become diseased. Being infected merely means that tubercle bacilli have entered the body. One is ill with tuberculosis when the infection has progressed to the point when there is evidence of destruction of parts of the body. The disease may be revealed by X-ray, or by such symptoms as high temperature, loss of weight, and persistent coughing. Only a small proportion of those infected ever develop the disease.

7. Can the presence of infection with tuberculosis be tested?

A characteristic reaction of the body to tuberculin, a chemical product of the tubercle bacillus, reveals whether or not there is an infection with the bacillus. The test can be made either by injecting tuberculin under the skin or by applying it to the skin in a patch test. There are various preparations of tuberculin in use today, the most generally accepted, called P.P.D. (Purified Protein Derivative), was originally developed by Dr. Florence B. Seibert.

8. What parts of the body may be attacked by tuberculosis?

Although tuberculosis may attack any part of the body, it has a very decided preference for the respiratory system. Deaths from tuberculosis of the lungs and other respiratory organs account for more than 90 percent of all the deaths from the disease. An additional 2 percent of the deaths are the result of a generalized spread of the disease throughout the body, and about the same proportion is due to tuberculosis of the central nervous system. Relatively rare are deaths from tuberculosis of the intestines and peritoneum, the vertebral column, the genitourinary system, or of the bones and joints.

9. How many cases of tuberculosis are there in the country?

On the basis of mass X-ray surveys, it is estimated that there are at least ten active cases of tuberculosis for every annual death from the disease. This means that there are in the neighborhood of half a million cases in the country currently. Tuberculosis is a reportable illness, yet many cases go undetected and, therefore, unrecorded until death occurs. In 1949, the number of reported new cases was 132,000, or about 30 percent higher than that for 1940. The increase is undoubtedly attributable to better methods of case finding through the more widespread use of mass X-ray techniques, some of which were perfected during the war.

10. What has been the trend in the age distribution of tuberculosis deaths?

The decline in tuberculosis mortality has not been uniform for all ages; the greatest progress has been made among the age groups which used to suffer the highest death rate from the disease. Forty years ago, the peak in the tuberculosis death rate for white males was in the age group 35 to 44, and for white females, 25 to 34. With the largest improvements registered in childhood and in the early adult years, the peaks of mortality are now between ages 65 and 79 for white males and past 75 for white females. In other words, tuberculosis is beginning to take on the same age pattern as most other chronic diseases, with the heaviest toll among the old, instead of concentrating among the young as formerly.

11. Has infection with the tubercle bacillus been decreasing in this country?

Infection has been decreasing in striking fashion as health measures have provided for better detection of active cases and for increasing segregation of those capable of spreading the disease. Tuberculosis, which once was so common that in some areas hardly anyone avoided contact with it, is becoming so rare in many sections that there is little chance to become infected. Tuberculin tests in a four-county district in Minnesota in 1946 and 1947 revealed that less than one school-age child in 219 had been infected, indicating virtual eradication of tuberculosis among those 15 years old or less. In the relatively more crowded city of Minneapolis, the annual infection rate among high-school students in recent years has been one in 500, about one-tenth of the rate of two decades earlier.

12. What are the chances in the United States of dying from tuberculosis?

The chances are less than three in 100 that a newly born white male baby will eventually succumb to tuberculosis, and below two in 100 that a white female baby will die of the disease. In 1920 the chances were more than twice as great for a white male baby and more than three times as great for a white female baby. Whereas the likelihood of dying from tuberculosis has been decreasing steadily since 1920, that of dying from the other chronic diseases has been increasing. The chances of death from cancer are now five times as great as from tuberculosis for a white male baby and twelve times as great for a white female baby.

13. How did the United States compare with other countries in tuberculosis mortality before World War II?

Only four countries in the world with reliable mortality statistics had lower tuberculosis death rates than the United States in 1939, the last prewar year. They were Denmark, The Netherlands, Australia, and New Zealand. For that year, the death rate in our country was about 47 per 100,000, compared with 34 in Denmark, 39 in Australia, 40 in New Zealand, and 41 in The Netherlands. The other countries in Western Europe lagged behind with the rate in England and Wales at 62, Italy 76, and Switzerland 80. The highest rates were recorded in the Orient and in extremely cold climates. The figure for China was estimated at about 400 to 500 annual deaths per 100,000 persons, and in Greenland around 550. Even the American territory of

Alaska had a death rate of 437 per 100,000 from tuberculosis in 1939.

14. How has World War II affected the tuberculosis death rate?

The effect of World War II on tuberculosis mortality varied in different areas. Where there was active fighting and destruction, with a tremendous deterioration in living conditions, tuberculosis mortality rose appreciably. In the United States and Canada, however, tuberculosis has declined as a result of increased efforts to detect new cases and of improved methods of therapy. In this country in particular, the X-ray examination of millions of young persons who came up for military service and again on discharge greatly advanced the case detection work. Since the end of hostilities, the mass X-ray examination of the general population has increased; many health departments conduct these examinations free for local residents.

In most of continental Europe, the death rate from tuberculosis skyrocketed during the war. Although Denmark and Norway were able to keep some of their health services operating, most of the nations overrun by the Nazis suffered almost complete destruction of their public health organizations and equipment. In The Netherlands, for example, the tuberculosis death rate more than doubled from 1939 to 1945. In cities like Vienna and Berlin, the wartime peaks were at least twice the prewar levels; in Warsaw they were more than three times as high. Even in London, tuberculosis mortality rose 75 percent during the early years of fighting. Postwar overcrowding in half-destroyed communities, the continuation of low levels of diet, the poor state of morale in many countries, and the still grossly inadequate medical facilities in large areas of continental Europe have combined to make the immediate postwar, as well as the war years, serious for tuberculosis. The later postwar years saw great reductions in tuberculosis mortality.

15. What is the United Nations doing to combat tuberculosis?

In cooperation with the United Nations International Children's Emergency Fund and the Scandinavian relief societies, the World Health Organization of the United Nations has been conducting mass case-finding campaigns on millions of children and vaccinating those free from tuberculosis infection. The vaccine, BCG (Bacillus Calmette-

Guérin), is a prophylactic serum used to protect against all forms of tuberculosis. By March, 1950, more than 20,000,000 children and young adults had been tested and about half of them vaccinated under the United Nations program. Tuberculosis centers have been established in many countries, and the medical institutions of some of the war-torn nations of Europe are being helped to get operating again. Drugs and X-ray equipment are also being supplied, and physicians and nurses are being trained. The World Health Organization is conducting research in the chemotherapy of tuberculosis, especially in the use of the new antibiotics like streptomycin.

16. How do the death rates from tuberculosis for males and females compare in the United States?

More males than females in this country die of tuberculosis. The mortality from the disease among white males is twice that among white females. Among the colored, the mortality of males is about one and one-third that of females. The excess of male deaths is found particularly at the later ages; the death rate for females is higher only between the ages of ten and thirty.

17. How do tuberculosis death rates for white and colored persons compare?

In 1948, the death rate from tuberculosis among the colored was more than three times that among the whites. Colored male mortality from the disease is about three times that of white males, and colored female mortality nearly four times that of white females. At certain ages, particularly in the school and early adult years, the rates for the colored population are more than seven times the rate for the white population. Among the colored races themselves, there is almost as much difference as between whites and nonwhites. The American Indians and the Chinese have an overall mortality from tuberculosis higher than for Negroes; however, mortality from tuberculosis for the Japanese is somewhat lower than for the Negroes.

18. At what ages is tuberculosis mortality at the minimum?

The lowest tuberculosis mortality is found today among children at ages five to nine years. This is the case in the United States for both sexes and for whites and nonwhites.

19. Can tuberculosis be inherited?

The disease itself cannot be inherited, any more than one can inherit a cold or whooping cough. There is often, to be sure, a high familial incidence of tuberculosis. This is largely explained by the close contact in which family members live, a situation which involves danger of infection when any single member has a disease as communicable as tuberculosis. An added factor is the inheritance of a susceptibility to the disease. Also, certain types of body build have been associated with a proneness to the development of tuberculosis. Thus three factors – the tubercle bacillus, environment, and body constitution bear on the susceptibility of any one individual to tuberculosis. Inheritance alone cannot account for the disease.

20. Is there a high mortality from tuberculosis among the husbands or wives of known tubercular patients?

The familial pattern of tuberculosis manifests itself not only in a high mortality from the disease among the children, parents, or siblings of the known tuberculous, but also among their husbands or wives. Here again is further evidence that the disease is highly infectious and that it is likely to be transmitted from active cases to those who are in close contact with them. In some recent studies, the mortality from tuberculosis of the surviving husbands or wives of consorts who had succumbed to the disease was found to be three times that expected on the basis of general population death rates.

21. How does the tuberculosis death rate vary geographically within this country?

The lowest death rates from tuberculosis are found in the West North Central states, while the South and Southwest have the highest rates. About one-third of the states had death rates of less than 25 per 100,000 in 1948, and 11 had rates of less than 20. Iowa had the lowest mortality from tuberculosis, 10 per 100,000, and Arizona was at the other extreme with a rate of 82. The Arizona figure, however, is influenced by an influx of many tuberculous patients for treatment and rest who eventually die there. The local Indian and Mexican populations, whose standard of living is low, are also a factor in the high rate for Arizona. The high rates throughout the South reflect the relatively low living standards of many Negroes in that area.

22. Do many localities lack adequate facilities to care for the tuberculous?

This lack exists not only in some of the poorer and more backward areas but also in some of the more progressive places. In New York City, for example, intensive case-finding has uncovered many new cases for whose care adequate facilities are not available. Less than one-half of the tuberculous individuals registered were in hospitals in 1950. Almost one-third of the active cases those with positive sputum—were receiving care at home where they were endangering their families. Some of the tuberculosis wards in city hospitals were operating at more than their rated capacities.

23. Is tuberculosis an urban disease?

Because concentration of population helps to spread the disease, tuberculosis was long considered more of a health problem in cities than in the country. In 1890, the death rate from tuberculosis for urban areas was almost one and two-thirds that for rural areas. By 1940, however, the differential had decreased until cities had a death rate only about one-fifth higher, and since the recent war the gap has been closed still more. More recently, white females in urban areas had a death rate from tuberculosis substantially lower than in rural areas.

The concentration of public health work in our cities has contributed to this equalizing of tuberculosis mortality between urban and rural districts. Another important factor is the comparatively high standard of living of city families. Farm and rural nonfarm incomes are generally lower than city incomes; country housing is sometimes more crowded; and the general level of education, including that in the field of personal hygiene, is, on the whole, lower among country people. It should be pointed out, nevertheless, that the very highest mortality from this disease is found in the slum districts of some of our cities.

24. Is tuberculosis an occupational hazard? [2]

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[2] See answers to Questions 27 and 28 of Chapter XVIII, page 283.

25. Do social and economic factors influence the prevalence of tuberculosis?

From the beginning of the campaign against tuberculosis it was evident that the disease is most common among the poor. The death rates are high where the standard of living is low and the general state of the people depressed. The decrease in tuberculosis in this country has come about during a period which witnessed not only extension and improvement in medical service, but also a rising standard of living. The real income of the average family in this country has gone up sharply and with that rise has come the opportunity for a better diet, better housing, more recreation, and a higher level of education. Studies have shown that lowering the caloric, animal protein and vitamin C content of a diet leads to greater susceptibility to tuberculosis. Poor and overcrowded housing obviously make for a greater hazard of infection should there be any tuberculosis around. In general, the better off economically a population group is, the less likely it is to suffer from tuberculosis.

26. What has been the program of the antituberculosis campaign?

Since the beginning of the century an extensive and organized campaign against tuberculosis has been waged by public health agencies, the medical profession, and voluntary health groups. Case-finding has been stressed, especially in the early stages of the disease. In most instances the tuberculosis section of the local public health department has been the center for this work. Cases, once discovered, are registered and either treated in hospitals or sanatoria, when appropriate and practical, or are followed up in such other ways as will aid the patient and prevent his spreading the disease. The members of the families of new cases are examined carefully since they are a likely source for other active cases. Patients sufficiently recovered to resume work are helped to establish themselves in fields of employment suited to their capacity. Physicians and technical personnel are given specialized training in the detection and treatment of tuberculosis. Voluntary agencies do most of the work of educating the public with regard to the problem and the importance of being examined for the disease. They are also instrumental in obtaining adequate facilities for handling the disease and in providing funds for research.

27. At what stage of tuberculosis are the chances of cure best?

The earlier the disease is found, the better are the chances for cure. The importance of early detection is amply demonstrated by the experience of more than one thousand patients studied at Mount McGregor, where the Metropolitan Life Insurance Company formerly had a sanatorium for its employees. Of those whose treatment began when they still had minimal tuberculosis, 86 percent were able to work five years later; 10 percent were still under treatment or back after relapses; and 4 percent had died, though not all succumbed to tuberculosis. Of those with moderately advanced tuberculosis on admission to Mount McGregor, 57 percent were able to work five years afterward; 27 percent were under treatment; and 16 percent had died, almost all of them from tuberculosis. Of those in far advanced stages of the disease when admitted, only 29 percent were physically able to work five years later; 34 percent were being treated; and as many as 37 percent had died. Not only does early detection and treatment enhance the likelihood of cure, but it also saves from infection many persons who might otherwise contract the disease from an unknown and unknowing tuberculous individual.

28. What measures have been taken to prevent tuberculosis infection from animals?

Tuberculosis is a disease of many animals as well as man, and particularly of dairy cattle. Forty years ago many children in this country contracted tuberculosis by drinking the milk of diseased cows. Bovine tuberculosis was then widespread all over the world. A campaign in which both federal and state authorities cooperated to discover tuberculous cattle and destroy them, compensating farmers for the loss, was phenomenally successful. Bovine tuberculosis has been virtually wiped out in the United States. In addition, the policy of pasteurizing most milk for human consumption has resulted in almost complete elimination of cattle as a source of human tuberculosis infection in this country.

29. How has the sanatorium movement advanced tuberculosis control?

The sanatorium movement has made two major contributions to the campaign against tuberculosis. First, by isolating active tuberculosis patients from their families and the general public, sanatoria have prevented the spread of the disease. Secondly, by treating patients, by developing new medical and surgical methods and by proving the importance of rest and relaxation, the sanatoria have contributed greatly to the welfare of the tuberculous. They have cured or arrested the disease in many patients and have enabled them to return to their families and to normal lives. The sanatorium movement has grown until today there are many hundreds of such institutions which have served several million patients.

30. How many beds are available in hospitals and sanatoria for tuberculous patients?

At present there are about 104,000 beds for tuberculous patients in 726 hospitals and sanatoria, including both private institutions and those of the local and federal governments. Because of lack of staff or of operating income, or for a variety of other reasons, only about 83,000 of these beds are currently available for use. The American Trudeau Society, the medical branch of the National Tuberculosis Association, suggests a minimum of two and one-half hospital and sanatoria beds for every annual death from the disease; three beds per annual death is recommended. At present only about 73,000 of the existing available beds are considered up to acceptable standards by local, state, and federal agencies. Four states-- Colorado, Connecticut, Minnesota, and North Dakota—exceed the ratio of two and one-half acceptable beds per annual death from tuberculosis. An additional 28 states have between one and two and one-half beds per death. Although the majority of the states with relatively few beds are in the South, there are exceptions like California, Pennsylvania, and Ohio, which had ratios of 0.58, 0.98, and 0.87 acceptable beds per annual death from tuberculosis in 1948.

31. What additional tuberculosis facilities are needed?

According to the state and territory plans submitted to the Public Health Service under the Hospital Survey and Construction Act, an additional 83,000 acceptable beds were needed in 1948. This is more than the number of acceptable beds then existing. At that time more than 8,000 tuberculosis beds were either under construction or proposed. With the death rate from tuberculosis dropping rapidly, some states may achieve the recommended ratio of beds to deaths even with limited construction. On the other hand, some states with high case rates and low bed facilities will require a concentrated effort of sanatorium construction to begin to meet their needs. Although the Tuberculosis Control Section of the Public Health Service has enabled many state and local health organizations to purchase equipment for mass X-ray surveys through grants in aid, there is still a need for wider case detection, especially in the states with high death rates and large colored populations.

32. What lines of research are now being followed in the campaign against tuberculosis?

Although eradication of tuberculosis in this country is at least theoretically possible with present means, it would be greatly speeded if short-term cures could be effected. With that in mind, the Public Health Service and many private agencies are concentrating on research in chemotherapy. In addition, studies are also being made in the field of immunology. The Public Health Service is now engaged in a long-range survey of the effectiveness of BCG vaccine and is also testing various tuberculin and histoplasmin sera. Work is being done on how best to diagnose tuberculosis, and improvements are constantly being made in the design and use of X-ray and radiofluoroscopic equipment. Efforts are being made to ascertain the reasons why a high proportion of tuberculous patients leave hospitals and sanatoria before receiving medical discharges. Studies are also in progress on relapses among patients who have been medically discharged.

33. What is the outlook for the effective use of chemotherapy against tuberculosis?

At present one of the new antibiotics, streptomycin, has considerable effectiveness in arresting the development of the disease in early stages, especially in miliary tuberculosis, where the infection may be fairly widespread. Other antibiotics have also been tried against tuberculosis, and some relatively new ones are now being tested on experimental animals or in clinical work. So far none of them has been able to bring about a complete cure, and in many instances a cessation of treatment with the drug is followed by a resurgence of the illness. Most of the antibiotics have certain toxic side effects and must be administered under the careful supervision of a physician. There is now such concentration of effort in the field of chemotherapy that it seems probable that an agent effective against the tubercle bacillus will be uncovered. Until then chief reliance must be on the present methods of therapy.

34. What part does occupational rehabilitation of the ex-tuberculous play in controlling the disease?

Occupational rehabilitation is important in tuberculosis control because patients discharged from sanatoria can easily relapse into serious illness if they overextend themselves. Rehabilitation projects where the ex-tuberculous may work under medical supervision and only within the limits of their physical resources help smooth the abrupt change from a sanatorium back to normal life. The experiences of Papworth Village and Preston Hall in England, and of the Altro Workshop in New York City demonstrate the usefulness of such controlled and graduated work. Significantly, of those who had once had minimal or moderately advanced tuberculosis and had spent at least three months at Altro after discharge from sanatoria, 85 per cent were still alive ten years later. In general, the mortality of "graduates" of the Altro Workshop for the ex-tuberculous has been almost as low as that of persons of the same age in the population at large.

35. Who have been the leading figures in the fight against tuberculosis?

The outstanding men in the fight against tuberculosis have lived in relatively modern times. René T. H. Laennec (1781–1826), a French clinician, developed the stethoscope and also introduced auscultation as a means of diagnosis. Robert Koch (1843–1910), the famous German bacteriologist, discovered the tubercle bacillus in 1882 and proved it was the cause of tuberculosis. He also contributed to the discovery of tuberculin tests and, as director of the Institute of Infectious Diseases in Berlin, helped to train many medical researchers. Sir Robert Philip (1857–1939) was largely responsible for working out what are now the routine procedures in dealing with tuberculosis as a community health problem. This Scottish physician set up the first tuberculosis clinic on record and established many corollary services, including home supervision of some patients and treatment of others in sanatoria. Edward L. Trudeau (1848–1915) was the American doctor who pioneered the sanatorium movement in this country. At his small camp at Saranac, N. Y., in 1885, he began demonstrating the efficacy of rest, fresh air, and adequate diet in tuberculosis. His first two-bed little red cottage was the precursor of the chain of more than seven hundred specialized sanatoria and tuberculosis hospitals in the country today. Hermann M. Biggs (1859–1923), for many years Medical Officer of Health of New York City, organized the first city health department laboratory and invited physicians to use it to test their patients' sputum. He introduced compulsory registration of tuberculosis cases and led in the establishment of one of the first state tuberculosis campaigns. Albert Calmette (1863–1933) and Camille Guérin (1872–) were the French scientists who developed the now standard vaccine against tuberculosis known as Baccillus Calmette-Guérin, or BCG.

36. How did the campaign against tuberculosis develop in this country?

The organized campaign against tuberculosis dates back to the end of the nineteenth century. In 1892, the Pennsylvania Society for the Prevention of Tuberculosis was founded with Dr. L. F. Flick as one of its leaders. A number of other small tuberculosis organizations, many of them lasting only a short while, came into being in the next dozen years. In 1904, at a convention of the American Medical Association, the National Association for the Study and Prevention of Tuberculosis was formed, with Dr. Flick again instrumental in its founding. Since then, the national association has grown until now it has affiliated agencies in all states and most of the territories. It has led in the education of the public on the subject of tuberculosis, in helping to train technical personnel, in persuading government officials of the importance of the disease and of the need for tuberculosis facilities, in raising funds for sanatoria, hospitals, research, case-finding, and other branches of the antituberculosis campaign. The Christmas seal drive alone has brought in close to $20,000,000 annually in recent years. There is now a Division of Tuberculosis in the Federal Public Health Service and in many local and state health departments. Tuberculosis is generally recognized as one of the major health problems of the nation.

37. What effect has the decline in tuberculosis had on the American population and economy?

Fifty years ago, tuberculosis had its peak mortality among white males at about 25 to 40, the ages when family responsibility was greatest, and at about 30 for white females, when many of them had young children to care for. The sharp decline in tuberculosis mortality since then has, therefore, had an incalculable effect on home life. The preservation of millions of families that otherwise would have been broken has meant not only that there were proportionately far fewer orphans, but also that great advances were made in education and the general well-being of the population.

Hundreds of thousands of working men have been saved from the disease by the improvements in medical and social science in the last half century. The men thus saved were able to do constructive work which has contributed greatly to the economy of the nation. Were it not for the advances in health and welfare- and the decrease in tuberculosis was one of the most important the United States could not have attained its present pre-eminent position among the nations of the world.

38. What is the outlook for eventual control of tuberculosis?

The outlook is favorable for virtually complete control of this disease. Not only has the fall in the death rate been accelerated recently, so that it is now going down 10 percent annually, but there is a greater effort than ever before to find new cases. At the same time, local state, and federal agencies are working for the establishment of new tuberculosis facilities. The federal government aids the states with grants for the partial payment of approved construction and also, to a smaller degree, for operation of completed institutions. These developments should result in many more patients being cured or their disease arrested. More isolation in institutions will mean fewer new cases in the community. Not only are more hospitals and sanatoria being built, but outpatient clinics are being established and educational programs set up both for physicians and for the general public. The combination of these efforts promises ultimate success in bringing tuberculosis to a relatively minor place among the causes of illness and death in this country. Eventually tuberculosis will be eradicated.

IX

THE MYSTERY OF CANCER

1. Where does cancer rank among the causes of death in the United States?

Cancer is now outranked only by heart disease as a cause of death in this country. Among women 30 to 59 years old, it is the leading cause of death. A half century ago, cancer was outranked by tuberculosis, pneumonia, diarrhea and enteritis, diseases of the heart, nephritis, accidents and violence, and cerebral hemorrhage. Although cancer is commonly a disease of adults, it is nevertheless one of the leading child killers. Among children aged five to nine, cancer, including the leukemias and Hodgkin's disease, is now the leading cause of death from disease.

2. What is cancer?

"Cancer" is the generic name for a disease including a number of ailments, all characterized by uncontrolled cell reproduction. Cancerous growths usually have no clear boundaries setting them off from normal tissues; cancer cells may intrude between the healthy cells and spread throughout the body. Cancers of practically every part of the body have been reported, although the heart, circulatory system, and muscles seem generally unaffected. A variety of cancerous growths, such as sarcoma and carcinoma, have been identified.

Cancer is not a germ disease, but there is some evidence that mammary cancer may be caused by a virus. Cancer is not infectious, at least not in man, and cannot be combatted by ordinary methods of artificial immunization. Plants as well as animals are susceptible to it, and it is among the diseases reported in early medical literature. The only cures now known involve destruction of the cancerous growth, either by surgery or radiation or both. Drugs have been found which may alleviate suffering from the disease and in some instances cause temporary improvement, but so far no drug cure has been discovered.

3. How does cancer kill?

Cancer kills by extending into the healthy tissue around it, robbing the neighboring parts of their nutrition, and in other ways interfering with their normal function. In addition, after a cancer has developed at one site, some of its cells may be carried by the lymph or blood to other parts of the body where they begin a new cancerous growth.

4. What are the usual signs of cancer?

There are seven symptoms which are sometimes called the danger signals of cancer. However, the appearance of any one or more of them does not necessarily mean that the individual has cancer; it does call for a careful checkup by a physician without delay. Even persons presumably in good health should have a physical examination annually, and women over 35, semi-annually. The seven danger signals are:

1. Any sore that does not heal;
2. A lump or thickening in the breast or elsewhere;
3. Unusual bleeding or discharge;
4. Any change in a wart or mole;
5. Persistent indigestion or difficulty in swallowing;
6. Persistent hoarseness or cough;
7. Any change in normal bowel habits.

Significantly, pain is absent from the list of signs of cancer. Pain is usually not evident in cancer cases until the disease is far advanced.

5. How many persons a year die of cancer in this country?

In 1948, cancer caused approximately one out of every seven deaths in the United States, killing more than 197,000 persons. In addition, there were more than 10,000 deaths in the year attributed to leukemia and to Hodgkin's disease, which are considered malignant diseases. The death rate from cancer alone was 135 per 100,000 population.

6. By how much is the expectation of life reduced by cancer?

If cancer were eliminated as a cause of death, the expectation of life of American men entering middle age would be increased by about a year and a half and of women by two years.

7. What is the probable number of cancer cases in our country?

The number of new cancer cases discovered annually has been about a third of a million. An additional third of a million previously diagnosed cases are still under treatment. Unfortunately, in many areas there is still little concerted effort to detect cancer cases, so that the true extent to which the population of this country suffers from the disease is not known.

8. How does the United States compare with other countries in cancer mortality?

The United Kingdom, France, Switzerland, and many other countries of Western Europe, as well as Austria and New Zealand, have reported higher death rates from cancer than this country in postwar years. It is significant that the countries with high recorded cancer mortality are also those with a generally high level of public health and medical practice. Thus, a good part of the international variation may be the result of efficiency in diagnosing cancer, in reporting it as a cause of death, and of the proportion of older people in the population. England and Wales, which had a cancer death rate of 186 per 100,000 population in 1947, the highest in the world, also has a high expectation of life. Countries like Mexico and Egypt, with reported cancer death rates under 25 per 100,000, have very poor records of longevity.

9. What has been the trend in cancer mortality in this country since 1900?

The recorded death rate from cancer has more than doubled since the turn of the century. Fifty years ago, 64 persons per 100,000 were reported dying from cancer, compared with 135 in 1948. In the same half century, there has been a great drop in mortality from many diseases, particularly tuberculosis, pneumonia, and the communicable diseases of childhood. The only important natural causes of death other than cancer which have shown a rise in mortality are the cardiovascular ailments.

10. Has there been a real increase in the chance of dying from cancer?

The marked rise in the death rate probably does not reflect the true cancer situation. In all likelihood the disease is little more prevalent age for age, today than in 1900. Mortality from the disease has always been much higher among the old than among children or young adults, and the proportion of the population surviving to old age has been growing steadily Persons saved from premature death from tuberculosis, pneumonia, or one of the acute diseases may now live to the ages at which cancer and heart disease take their great toll. If allowance is made for the changes in the age composition of the population, the present cancer death rate would be one and a half instead of two times that of 1900.

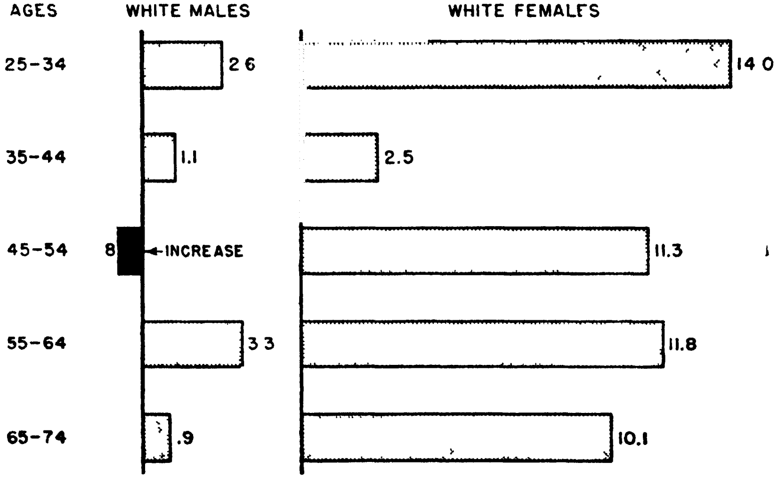

Chart 10. Percent decline in cancer death rates from 1932–1936 to 1942–1946 (Metropolitan Life Insurance Company, industrial business)

The great improvement in the diagnosis of cancer in the last 50 years has also added to a false impression of the trend of cancer mortality. With increasing urbanization has come an increase in hospitalization for serious illness and more frequent use of X-rays and laboratory techniques. A great many deaths formerly ascribed to other causes are now properly attributed to cancer.

In the last decade or so the death rates for certain types of cancer have fallen off after allowance is made for changes in the age and sex composition of the population, despite the continuing improvements in diagnosis. This suggests that the real peak in cancer mortality may be past. (See Chart 10.)

11. What is meant by "accessible" and "inaccessible" cancers?

"Accessible" cancers are those relatively easily reached for diagnosis or treatment. The most obvious example is cancer of the skin, which can be detected by sight and feel soon after developing, and is open to the simplest form of surgery or X-ray treatment. "Inaccessible" cancers are those of the internal organs, especially the ones not reached through any of the body openings. Cancers of the stomach, liver, lung, and brain are relatively "inaccessible." They would usually not be noticed early in their development unless uncovered by tests or complicated examinations, and their treatment is likely to require the more radical surgery.

12. Do men and women have different cancer death rates?

The difference between the cancer death rates of the two sexes has been diminishing. Mortality from cancer among white females is slightly lower than among white males in the United States today White women have a decidedly higher mortality than men at ages 25 to 54, but outside of that age range the white men have higher rates. Among the colored, females have a higher mortality from the disease than males. It is not clear whether that is a true difference or a spurious one. The relative accessibility of female cancers means that even with little medical attention, they are likely to be noticed, resulting in better reporting of female than male cases.

13. Is cancer principally a disease of later life?

Despite the fact that it ranks among the leading causes of death at almost every period of life, cancer is for the most part a disease of the middle-aged and the old. Some forms may take as long as 20 years to develop to the point where they cause death. In 1948, more than nine-tenths of all cancer deaths were among persons 45 years old and over. Only slightly more than 1 percent of the cancer deaths that year occurred among individuals under age 25.

14. Are there racial differences in cancer mortality?

There are recorded differences in the mortality of colored and white persons, but it is not possible to say whether they are the result of different susceptibilities, of differences in the quality and quantity of medical service available, or of other social factors. In 1948, the death rates for colored males exceeded those for white males at ages 35 to 59; the rates for colored females were in excess of the white rates in the age range 10 to 69. At other ages, the rates for the whites were somewhat higher.

Cancer of the skin is much less common among the colored than among white persons. Some interesting differences in the frequency of cancer of the various organs or sites of the body have been observed among various Asiatic peoples, but there is no good evidence that the total frequency among them is far different from that in the United States. It has been commonly observed that cancer of the cervix is less frequent among Jewish women than among the neighbors in their communities.

15. Are there geographic variations in cancer incidence and mortality?

Although cancer is most frequent in the South, the North has the highest mortality. The reason for the apparent contradiction is that cancer of the skin, which has a very low fatality rate, is relatively much more frequent among white southerners. As for cancers other than those of the skin, there is little regional difference in incidence among white males and only small variations among white females. The South has the most cancer of the skin, of the buccal cavity, and of the uterus, and the least cancer of the breast, urinary, respiratory, and digestive systems. These comparisons are made on the basis of field studies by the government in selected urban areas before the war. One cause for the difference between the South and North in respiratory cancer may be the greater degree of urbanization and industrialization in the North, with, consequently, a higher concentration of soot, petroleum-combustion products, and other impurities in the atmosphere.

16. Is cancer more prevalent in urban or rural areas?

The combined death rate from all forms of cancer is higher in urban areas than in rural. The reported mortality from cancer varies from a minimum for rural states to a maximum for those which have been most industrialized and urbanized. Also, the reported cancer mortality rises from a minimum in those states having proportionately the fewest doctors, to a maximum in those having proportionately the most doctors. Evidently, a great deal of urban-rural variation in cancer mortality reflects differences in the efficiency of diagnosing and reporting the disease.

17. Does cancer mortality and incidence vary with social-economic status?

Certain types of cancer seem to be more common among those at the lower end of the economic scale. Studies in England, for example, indicated a higher rate of cancer of the upper alimentary tract among the poor than among the rich. Certain skin cancers showed the same feature. These variations have been attributed to habits, diet, cleanliness, occupations, housing, and general exposure to soot, coal dust, etc. It is also clear that diagnosis is important in cure and that treatment is often expensive. Those in the lower social-economic groups may not be well enough educated in the advantages of routine examinations, early signs, nor have as ready access to medical facilities.

18. How does environment affect the chances of having cancer?

Under certain conditions, cancer can be caused by a number of environmental factors. Malignant growths are known to be caused by actinic rays, X-rays, radium radiation, and constant chemical or mechanical irritation. About 300 substances, ranging from the dust of some metallic elements to complex organic compounds, have been shown to have resulted in a high incidence of cancer among those exposed to them. Many of these chemicals are becoming quite common in modern industry. The relatively high incidence of cancer of the skin, especially of the exposed portions of the body, among white sailors and farmers is an example of environmental cancer. Apparently pigmentation of the skin influences the susceptibility to cancers caused by sunlight, since such growths are about seven times as common among white persons as among colored.

19. Is cancer an occupational disease?

There are a few occupations with a cancer incidence higher than average; of these, radiologists provide a good example.[1]

20. How does diet affect cancer?

Apparently susceptibility to certain types of cancer is related to diet. For example, cancer of the thyroid, like goiter, is found to a greater degree than elsewhere among residents of areas where the drinking water is iodine deficient.

In experimental animals it has been found that diets just barely sufficient in variety and in caloric content to support life result in a lower susceptibility to cancer than overly generous diets. Life insurance data also show that persons overweight at the time of applying for insurance have a cancer incidence later in life that is greater than average. Being overweight is a contributory factor in other diseases as well, including ailments of the heart and the circulatory system.

21. Can cancer be inherited?

Cancer in man is not believed to be inherited, but there is evidence that a susceptibility to the disease runs in families. Studies indicate that identical twins are much more likely than fraternal twins to have the same type of cancer, in some cases even developing the disease simultaneously. There are families in medical history in which there has been a strikingly high incidence of the disease. A person will not necessarily have cancer if other members of his family had the disease, but such persons should be examined at frequent intervals.

22. What has been the recent trend in cancer mortality among women?

After allowance is made for the increasing proportion of aged in the population, it is found that cancer mortality among females in the United States has been declining since about 1927.

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[1] See answer to Question 30 of Chapter XVIII, page 284.

23. What has been the recent trend in cancer mortality among men?

Mortality from cancer among men is rising consistently, even after allowing for the aging of the population. However, the current rate of increase is not as great as it was two decades ago.

24. What are the most common sites for cancer among women?

In order of frequency, the most common sites for cancer among women are the breast, the uterus, the digestive organs and peritoneum, and the skin. Together they account for about three-quarters of the cancers in women. Among the less common sites for female cancers are the genital organs, other than the uterus, the urinary tract, the rectum and anus, and the mouth. Two-thirds of all cancers among females--those of the breast, uterus, skin, rectum and anus, and the mouth—are at sites easily accessible to diagnosis and treatment. Because of this, female mortality from malignant growths can be decreased substantially without further scientific advance by merely applying more generally the medical knowledge and techniques now available.

25. What are the most common sites for cancer among men?

The most common site for cancer in men is the digestive tract and peritoneum, followed by the skin, the genitalia, the mouth, the respiratory organs, urinary tract, and the rectum and anus. The stomach and other digestive organs account for three-tenths of all male cancers and are among the relatively inaccessible sites of malignant growths. Only about a third of the cancers among males—those of the skin, mouth, and the rectum and anus— are relatively accessible to diagnosis and treatment.

26. What has been the trend in mortality from the accessible cancers?

Within the last decade and a half there has been a definite reduction in the death rates from accessible cancers among both males and females, according to the experience among Industrial policyholders of the Metropolitan Life Insurance Company. The greatest improvements among men were in mortality from cancers of the mouth and of the skin, and among women in mortality from cancers of the vulva and vagina, the mouth, the uterus, and the skin. Although the recent gains have been proportionately about the same for both sexes, the mortality of females from accessible cancers is still around three times that of males. This is largely because of the high incidence of cancer of the breast and uterus among women.

27. What has been the trend in mortality from the inaccessible cancers?

According to Metropolitan Life Insurance Company data, cancer at inaccessible sites has continued to show a high mortality, though there are some where gains have been made. Among women, mortality from inaccessible cancers has been reduced since about 1935, but the improvement was only about half as great as that for accessible cancers. The best record was made in cancers of the stomach, liver, esophagus, and bladder. The death rate from inaccessible cancers among men has shown an overall rise in recent years; however, decreases have been recorded in mortality from cancer of the stomach, liver, esophagus, and bladder. Mortality from cancer of the respiratory system, especially the lungs and bronchus, has increased rapidly in the last few decades.

28. What has been the trend in mortality from cancer of the skin?

Cancer of the skin, while the most common form of the disease, is also one of the most readily cured. Since skin cancers are likely to be noticed early in their development, there is a good chance that they will receive treatment before they have had time to spread to other organs. Although skin cancers account for more than a sixth of all cancers among males in this country, they cause only about one-fortieth of the male cancer deaths. The death rate from skin cancer has been falling for a number of years. The mortality of women from skin cancer is even lower than that of men.

29. Is there any relation between smoking and cancer of the lung?

It has been observed, in a number of surveys, that among lung cancer patients the proportion of heavy smokers is larger than among patients with other cancers. However, it is not yet known what the cause-and-effect relationship may be, if indeed there is any at all.

30. What indications are there of improvement in the cancer situation?

The most important sign of an improvement has been a reduction in the death rate from cancer among women. Cancer research has been intensified on all fronts. The facilities for dealing with cancer have been and still are being expanded, the awareness of the population has been heightened, and the skill of doctors in dealing with cancer also increased. As a result, the rate of survival for cancer patients receiving treatment has risen markedly in many areas.

31. Why is the early reporting of cancer symptoms so important?

With present methods of treatment, the chances of cure are immeasurably better when the cancer is caught in the early stages. It is possible under those circumstances to remove or kill the cancer cells completely, using surgery or radiation. Once the growth has spread to other parts of the body, treatment is more difficult and the chances of cure seriously reduced.

32. Are many cases now diagnosed within a month of the appearance of symptoms?

Within the last two decades the proportion of patients seeking medical aid within a month of the first symptoms of the disease has risen 50 percent. Nearly 30 percent of the cases of cancer of the breast are now brought to the attention of a doctor within a month of the patient's first realization that something was wrong. A study in Vermont in 1947 showed that 60 percent of all cancer cases reported were still in the early stages, as compared with only 20 percent ten years earlier. The time lag between diagnosis and treatment has also been cut almost in half within the last two decades according to data from Massachusetts.

33. Is there evidence that medical and surgical treatment of cancer is improving?

Increasing numbers of cancer patients are being discovered in early stages of the disease and are receiving more adequate care. This is generally true throughout the country. As a result, there has been a steady rise in the survival rate of cancer patients.

34. What are the chances of developing cancer?

The chances at birth of eventually developing cancer are about two in nine for females and slightly less for males (two in ten).

35. What are the chances of eventually dying of cancer?

At present the chances at birth are about one in seven that a white male in the United States will eventually die of cancer, and about one in six that a white female will. It has been estimated that with present medical and surgical techniques, mortality from cancer could be reduced one-third from its present level by early detection of more cases and by increasing the availability of adequate treatment.

36. How much is being spent annually on cancer research in this country?

The American Cancer Society estimates that over 50 million dollars had been devoted to cancer research in the four years ending in 1950 by the voluntary health agencies and the government. Currently, the annual rate of expenditure is about 24 million dollars, including the work of smaller private foundations, medical schools, and hospitals. Of this total, about 3.7 million dollars are spent by the American Cancer Society, more than 6.5 million dollars by the National Cancer Institute, about 1 million dollars by the Damon Runyon Memorial Fund, and well over a million dollars by the U. S. Atomic Energy Commission.

37. What are the main fields for cancer research today?

The attack on cancer is being advanced in the fields of both pure and applied science. In addition to the medical profession, physicists, chemists, biologists, and statisticians are engaged in cancer research. Fundamentally, the study of cancer is the study of life and growth. Since the development of cancers from healthy cells is a misdirected form of reproduction and normal life processes, much of the basic biological and biochemical research now carried out has value in the study of cancer. There is a special concentration on investigating the simpler forms of life such as the one-celled paramecium. The development of embryos is also being studied, and new agents are being sought which act as cancer-producers in experimental animals.

The chemistry of the body is being explored with emphasis on enzymes, hormones, and the glandular systems of mammals, as well as the metabolism of various foods. Animals with and without cancers are being fed a variety of diets to see what effect deficiencies and excesses of certain substances have on cancer growth.

The apparent isolation of a virus in mammary cancer in mice is being followed by an intensive search for similar factors in other animals and other malignant tumors.

A chemotherapeutic agent is being sought which can arrest cancer development or possibly even cause complete regression. Nitrogen-mustards, certain antifolic acid and antiandrogen substances, urethan, and a bacterial product known as a polysaccharide have been found which have some but not all of the qualities needed. So far most of these chemicals have serious toxic effects and do not bring about a complete regression of cancers, but they point out directions for further work.

At the same time improvements are being made in surgery and radiation, and in both chemical and X-ray methods of diagnosing the disease. The Atomic Energy Commission has produced a number of radioactive isotopes which have an affinity for specific organs, making possible the introduction of cancer-killing rays into previously inaccessible parts of the body. In particular, radioactive iodine for treatment of thyroid cancers and radioactive phosphorus for treatment of bone cancers have found wide use. Radioactive isotopes can also be used as tracers in metabolism studies, to follow the course of ingested substances through the body. A smear test and blood test have been developed to aid in the early discovery of cancers of certain internal organs.

The field for cancer research is a wide one, but advances are now being made in almost all sectors. Considering the great accomplishments of recent years, it would not be surprising if the cancer riddle were solved within another decade or so.

38. Why is the accumulation of statistical data so important in cancer research?

Since the mechanism of cancer is not yet fully understood, it is often by following out statistical leads that new knowledge is gained. Studies may reveal, for example, that among two groups of mice living under almost identical and controlled conditions and as similar genetically as possible, there is a much greater incidence of cancer in those subjected to long periods of ultraviolet radiation. Such radiation might then be added to the list of statistically proven carcinogenic agents. Because there are such wide gaps in knowledge about cancer, the statistical, mathematical approach is even more important in cancer research than in most other fields of medical work.

39. How does a cancer registry help in cancer research?

A cancer registry, which is a record of all tumor and cancer cases within a given institution or geographic area such as a state, helps in cancer research because it is a source of statistical data about the incidence and the death rate of the disease. A cancer registry should include fairly complete information on the diagnosis and treatment of each case, as well as the personal history of the patient; it should follow up each individual at least once a year after the cessation of treatment for information on possible recurrence of the disease. In 1950, 36 states already had or were starting cancer registries. The three oldest registries, all of which have already contributed a great deal to our knowledge of cancer, are in Connecticut, Massachusetts, and New York.

40. What facilities are there for the detection of cancer in this country?

The great majority of cancer cases are discovered by general practitioners and by general hospital staffs. There are, however, a few hundred cancer detection centers in the country accommodating thousands of patients a week. These are scattered through the nation, in almost every state. Some states operate traveling detection and diagnostic units, and one state has a group of specialists who can on occasion act as a traveling tumor board.

41. What facilities are there for diagnosis and treatment?

Complete diagnosis of cancer—determination of the type of growth, the primary and all secondary sites, etc.—often requires special laboratory equipment and tests. There were 87 diagnostic clinics in the United States in 1950 which have been approved by the American College of Surgeons, and 30 states had made provisions for diagnosing cancer among indigent persons in state facilities or in clinics sponsored by the states. In addition, by the beginning of 1950, the College of Surgeons had approved 10 cancer hospitals, 449 clinics, and 129 cancer detection centers. Only five states at that time nad no specialized cancer diagnostic or treatment clinics.

42. What government and voluntary agencies are working to combat cancer?

The organizations in the field of cancer range from voluntary fund-raising groups and endowed foundations to a federally supported center for research. In the area of money-raising and the provision of local service, the largest organization is the American Cancer Society, which devotes its resources to education about cancer, the support of detection centers, aid to cancer patients, the establishment of new clinics, and to research. The Damon Runyon Fund raises money solely for research purposes, and the National Cancer Foundation is primarily concerned with aiding cancer patients. On the government side, there are the local and state health agencies and the National Cancer Institute of the Public Health Service. The latter not only does its own research but also provides funds for other research groups and helps pay for the construction of new cancer facilities.

43. To what extent is the public informed about cancer?

Recently, studies have been made by the Massachusetts Department of Public Health to discover the extent of public knowledge about cancer. In New Bedford, for example, a typical New England mill city, it was found that more than one-third of those interviewed had a fair background of knowledge about the disease, but that more than one-sixth had practically no knowledge about it at all. Younger persons, it turned out, were far better informed on the subject than the older persons, among whom cancer is more prevalent. The studies indicated that there is still plenty of room for further education of the public about cancer. The increase in public knowledge will undoubtedly help to bring down the mortality of the disease.

X

THE CONTROL OF DIABETES

1. What is diabetes?

Diabetes mellitus is a disease which reduces the ability of the body to get energy from sugars and starches (carbohydrates). Unlike the normal person, the diabetic cannot get full benefit from his food. Sugar accumulates in his blood and is then eliminated in the urine. In this way, one of the main energy constituents of food is lost to the diabetic, who also loses both weight and strength as a result. A vicious cycle is established in which the diabetic is driven to eat to satisfy his hunger but cannot properly use the extra food which he consumes.

2. What causes diabetes?

The real cause of the disease has not yet been discovered. It is known that diabetics lack a substance called insulin. This is a secretion by clusters of cells known as the islets of Langerhans which are, located in the pancreas, a gland behind the stomach. Without insulin, sugars and starches cannot properly be utilized. The diabetic either produces too little insulin or the insulin he does produce is counteracted by the secretions of other glands.

3. What are the symptoms of diabetes?

At the onset of diabetes there are generally no obvious symptoms. In later stages, the disease is marked by excessive thirst and hunger, frequent urination, and loss of weight and strength. In some instances, diabetes may first be noticed because of blurring of vision, the slow healing of wounds, itching, or even the occurrence of gangrene of the toes or feet.

4. How is diabetes usually diagnosed?

Even before symptoms develop, diabetes can be detected by simple laboratory tests. In the presence of the symptoms described previously, the finding of sizable amounts of sugar in the urine is usually sufficient to make the diagnosis, but generally a test is also made to determine the amount of sugar in the blood. In some instances where the results are still not clear, a special procedure known as the glucose tolerance test is used. This involves testing the urine and blood for sugar just before administering a measured amount of sugar or glucose and testing again at half-hour or hourly intervals for two to three hours afterward.

5. How are most diabetics discovered?

It is unfortunately still true that the disease is usually not diagnosed until the symptoms appear, until there are serious complications, or until it is discovered accidentally on medical examination during illness or in preparation for an operation. An increasing number of cases, however, is being discovered in the course of routine private, industrial, and life insurance medical examinations.

6. How many diabetics are there in the United States?

According to the American Diabetes Association, approximately 1,000,000 persons in the United States have been diagnosed as diabetic, and it is estimated that there are another million who have the disease but do not know it. Because cases of diabetes are not reported to public health authorities, there are no exact figures available.

7. How many new cases occur each year?

The number of new cases is at least 60,000 annually. This is an estimate based upon statistics of deaths from the disease and facts on the average length of life of patients. The figure given is a minimal estimate; the true number is probably appreciably higher.

8. How many die from diabetes each year in the United States?

About 39,000 deaths in the United States in 1948 were classified as due to diabetes; the death rate was 26.4 per 100,000 population. Not all the deaths of diabetics, however, were ascribed to diabetes. If all cases involving the disease had been counted, the death rate would have been at least 10 percent greater. In fact, checks made in the states of Massachusetts and Washington showed that only two-thirds of the deaths of diabetics were recorded as caused by diabetes. The number of deaths of diabetics may be as high as 60,000 annually.

9. How does diabetes rank among the diseases?

Diabetes is a serious health problem, although the leading chronic diseases—heart disease and cancer—involve many more cases. The National Health Survey of 1935–36 placed diabetes sixth among the chronic diseases in number of days lost from work or other usual activity. In 1948, diabetes ranked ninth among all the diseases causing death in this country, and accounted for 2.6 percent of all deaths.

10. How does the prevalence of diabetes in the United States compare with that in other countries?

Diabetes is a universal disease. It is found in all countries and among all races, but with wide variations in frequency. Accurate information on the number of cases of the disease is not available, but mortality statistics indicate that diabetes is at least as prevalent in the United States as in any other country in the world. The death rates from diabetes are relatively high in most of Western Europe and in the white population of the countries in the British Commonwealth; they are generally low in Eastern and Southern Europe and in Latin America. Little is known about diabetes in the tropics or the Far East, but if the recorded mortality in Japan is a guide, the disease is comparatively rare in the Orient. Altogether, the range of the reported mortality rates is from less than 5 per 100,000 in some countries to more than 25 in the United States. Where doctors and medical facilities are lacking, many cases obviously escape diagnosis and the recorded death rate from diabetes is accordingly low. The sex and age distribution of the population and the prevailing standard of living also play a part in determining the level of diabetes death rates.

11. What geographic variations in diabetes are found within the United States?

In 1946–47, when the annual death rate for the nation as a whole was 25.5 per 100,000, the rates for the states varied from a minimum of 9.9 in New Mexico to a maximum of 40.5 in New York. In general, the higher death rates are found in the Northeast and the lower ones in the South and Southwest. In part, the state variations reflect the differences in the age and sex composition of the population, but again the low rates in some areas are probably the result of failure to diagnose the disease because of inadequate medical facilities.

12. Is death from diabetes more frequent in cities than in the country?

Death rates from diabetes are about 60 percent higher in cities of the United States than in the country even when adjustments are made for differences in the average age in the two groups. Diabetes mortality is highest in the largest cities (100,000 or more population). The rates for moderate size communities (10,000 to 100,000 population) and for small places (2,500 to 10,000) are somewhat lower, but still above those for rural areas.

13. How does the onset of diabetes vary according to age?

Diabetes may occur at any age, but it is comparatively rare among children and young people. The rate of onset increases with advancing age, especially after 30 or 35. Less than 1 new case out of 20 is found among persons under 25 years old; about one-seventh of the new cases occur among those from 25 to 44; more than half at ages 45 to 64; and a quarter at 65 and over. (See Chart 11 on following page.)

14. How do the prevalence and mortality of diabetes vary with age?

The same general pattern of increasing rates with advance in age is found both in the prevalence of diabetes and in diabetes mortality. The peak in the prevalence rate, shortly after age 70, comes several years after the peak of onset, about age 65; the maximum death rate is even later in life. Of the existing cases, slightly less than one-fifth are under 45, a little less than one-half between ages 45 and 64, and about one-third are 65 and over.

15. How do the sexes compare in the prevalence and mortality from diabetes?

About five out of every eight known diabetics are females. The death rates, especially in later life, are considerably higher for females than for males. These differences between the two sexes must be con-

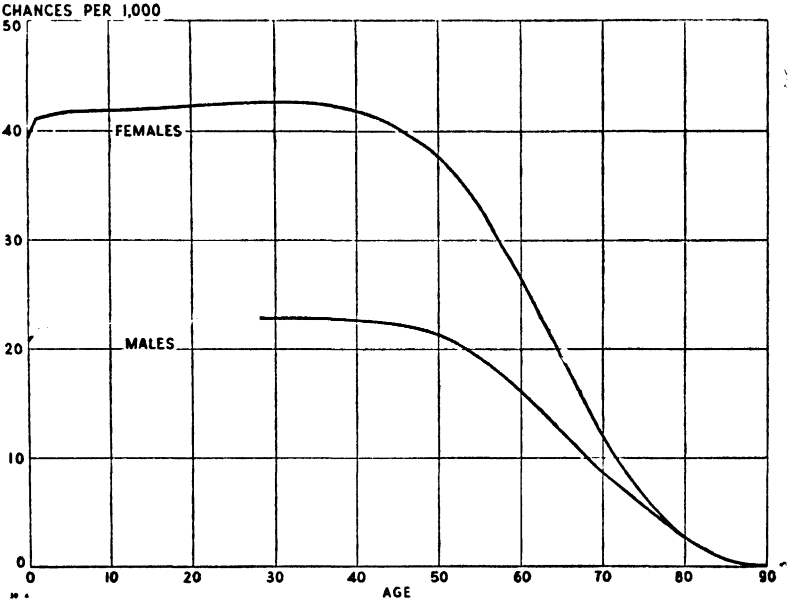

Chart 11. Chances per 1,000 of eventually becoming diabetic, according to sex and age

sidered in the light of the fact that there probably are more unrecognized diabetics among men than among women.

16. Does the death rate from diabetes vary according to marital status?

The mortality from diabetes is higher among married women than among the single, but there is no significant difference by marital status among men. The excess of deaths among married women is found at all ages above 25. Among younger women the rate for the unmarried is higher, suggesting that diabetic girls are, perhaps, less likely to marry than nondiabetics. In part, the excess of diabetes among married females may be caused by strain on the endocrine system during pregnancy and menopause. In any case, the occurrence of sugar in the urine during pregnancy is not uncommon, and the gain in weight during pregnancy is not infrequently retained.

17. Is diabetes more common in thin or fat people?

Except in childhood and early adult life, overweight usually precedes the onset of diabetes. Insurance studies show that diabetes develops much more often in fat persons than in those of average weight or less. The greater the excess of weight, the higher the prevalence of diabetes. One study of males showed that individuals 25 percent or more overweight had a death rate from diabetes 13 times as high as those who were underweight. A study of women 15 to 34 percent overweight showed a death rate from diabetes 62 percent above the average. These findings are confirmed by clinical studies. For example, slightly more than one-half of the diabetic men and three out of five of the diabetic women in one survey were at least 20 percent above average weight. Frank obesity (40 percent or more overweight) was found in one out of every six men and one out of every four women diabetics. Fatness was particularly common among those whose diabetes began after middle life, especially among women. Studies of female diabetics show that the married women weigh more than the single. Apparently single women are much more figure-conscious than married women.

18. Are there any marked differences in the diabetes death rates of national and racial groups within this country?

There are wide differences in the reported mortality rates from diabetes for various groups, but they may merely reflect variations in medical care or economic status. Jews have long been observed to have a high death rate from the disease. A study in New York City showed that mortality from diabetes after the age of 45 was more than one and three-quarters times as high among Jews as among non-Jews.

About 40 years ago, persons of German and of Irish origin in this country also had diabetes death rates above the average, while those of Italian descent had low rates. Now, these nationality differences appear to be much smaller. The prevalence of diabetes among Italians in this country was reported recently to have risen much closer to the figure for the population as a whole. Negroes were also thought at one time to be relatively free from diabetes, but today their death rates are not much lower than among whites.

19. Is there any connection between occupation and diabetes? [1]

There are large differences in the death rates from the disease in various occupational groups. Persons engaged in the sale or serving of food and drink have high rates. In this group are hotel keepers, grocers, and butchers. Bakers, on the other hand, have a mortality only a little above average. At the low end of the mortality scale are those doing strenuous physical labor: building workers, coal miners, and stevedores. These occupational groups, of course, vary with respect to income so that to some extent the differences in death rates from diabetes may reflect differences in nutrition and in medical care.

20. Is there a seasonal variation in the onset of diabetes?

It is not known whether the onset of diabetes has any seasonal pattern because the onset is usually slow and cannot be pinned down to a particular week or month. Mortality from the disease does show marked differences according to season, with the rates rising in winter and falling in summer. This seasonal change is characteristic of most chronic diseases and reflects largely the frequency of fatal respiratory complications among those suffering from chronic disease.

21. Is there any relation between sugar consumption and diabetes frequency?

There is apparently little, if any, direct connection between sugar consumption and the frequency of diabetes. Those areas in which the consumption of sugar is high do not show an excessively high frequency of diabetes. The trends in sugar consumption and diabetes frequency have often been in opposite directions.

22. Can diabetes be caused by injury?

Instances of diabetes developing directly from an injury are exceedingly rare because this could happen only if there were a major injury to the pancreas, which has a well protected position in the body. In any case, it is doubtful whether such a development would occur unless a predisposition to the disease already existed. An injury thus might accelerate the onset of the disease. A temporary increase in the severity of existing diabetes often follows an injury.

[1] See Chapter XVIII, page 272.

In most instances where diabetes is supposed to have been caused by an accident, the disease was simply discovered in the examination following the accident. This is not an unusual way in which new cases are found, particularly among older people. The development of gangrene, after even so slight an injury as stubbing a toe, is too often the circumstance that leads to the discovery of the disease.

23. Can diabetes be caused by nervous strain?

There is no good evidence of this. It is true that sugar is sometimes found in the urine during and after a period of nervous tension, but such glycosuria is transitory. If continued nervous strain were a factor in causing diabetes, one might expect to find a high prevalence of the disease among aviators and among soldiers in combat for long periods, but this is not the case.

24. Is diabetes inherited?

Diabetes itself is not inherited, but there is ample evidence that predisposition to the disease is. Studies show that diabetes runs in families, and occurs about as often as would be expected if a predisposition to the disease were an inheritable recessive characteristic. This means that the parents of any diabetic must at least be carriers of the disease in the genetic sense, even though they may not themselves be diabetic. On this theory, if both parents are diabetic, all their children would be susceptible to the disease. If one parent is diabetic and the other a carrier, the chances are that half their children would be susceptible. And if neither is diabetic but both carriers, one-fourth of their children would be susceptible.

Evidence of a hereditary factor in diabetes is also found in the occurrence of diabetes in twins. In one study, diabetes occurred in both of the twins in nearly 50 percent of the pairs of identical twins, against only 3 percent in the pairs of fraternal twins. Other surveys show that diabetes is found much more often in the parents and grandparents of diabetic children than would be expected on the basis of the prevalence of the disease in the general population.

25. Is the prevalence of diabetes increasing or decreasing?

There is no doubt that the number of known diabetics has increased faster than the population. This is partly explained by the large increase in the number of older persons, particularly women, among whom the incidence of diabetes is highest. In addition, more cases, particularly of the mild type, are detected now than years ago because the opportunities for discovering diabetes have so greatly expanded. Urinalysis has become a routine part of almost all medical examinations in the physician's office, at admission to the hospital, at admission to school or college, or on examinations for life insurance, for military service, or for employment. There has also been a sizable growth in the diabetic population because diabetics now live longer than they formerly did. It is not known, however, whether there has been a definite increase in the rate at which new cases occur in any age group. Some authorities believe that there has been an increase, at least in those countries where food has been plentiful and the pace of mechanization in industry, agriculture, and in the home, has been rapid.

26. What is the trend in the mortality of diabetes by sex and age?

Since the discovery of insulin, there has been a sharp downward trend in the death rate from diabetes among children and young people in this country. Among men, the reductions in the death rate extend up to age 55, and among women to age 45. At the older ages the mortality continued to increase until 1940. Since that year, however, there has been a sharp decrease in the death rates even in middle and later life. The death rates from the disease are now lower than in the pre-insulin years at all ages up to 65 among men and up to age 55 among women. At ages under 35 the reductions exceed 50 percent in each sex.

27. What has been the trend of mortality from diabetes in different parts of the world?

Because of the war, recent and reliable statistics on mortality are available for only a few countries. Prewar data showed that death rates from diabetes were rising almost continuously in most parts of the world. In the 15-year interval between 1919–20 and 1934–35, increases as large as 50 percent were common. In general, these increases were confined to the middle and older ages. Death rates among young people have been on the decline in all western countries since insulin came into general use.

28. What is insulin, and by whom and when was it discovered?

The insulin used by diabetics is manufactured chiefly from the pancreas of cattle and hogs. Although it was known for some time that a deficiency in the secretion of the pancreas was involved in diabetes, technical difficulties prevented the isolation of insulin from the other products of the gland and therefore, its use as a corrective of the condition. Its isolation was successfully accomplished in the late summer of 1921 by Frederick Banting, a young Canadian surgeon, aided by Charles H. Best, who was then a student in the medical school of the University of Toronto. The discovery was also assisted by Professors Macleod and Collip of the university. For this work, Banting and Macleod were awarded the Nobel Prize in Medicine for 1923, which they shared with Best and Collip. Primary credit for the discovery, however, rests with Banting who conceived the methods of separating out insulin and who developed his idea with persistence despite many rebuffs and discouragements.

The original insulin was a rather crude preparation, but many new types have since been prepared and tried. Today, a number of insulins are on the market. The major differences are in the rapidity and duration of action of the preparations.

29. How has improvement in the treatment of diabetes by insulin affected the longevity of diabetics?

The expectation of life of diabetics has increased at every age since the discovery of insulin. The drug revolutionized the medical management of the disease. It brought new life and vigor to diabetics so that most of them could live virtually normal lives. It cut down the hazard of injuries and infections and eliminated or postponed many complications of the disease. In addition, its discovery was a spur to more effective diabetes research. (See Chart 12 on following page.)

30. At which ages has the improvement in longevity of diabetics been greatest?

In general, the younger the age, the greater has been the gain in longevity of diabetics. Before insulin, the diabetic child was doomed to an early death. Few survived more than a year, and even this short period was one of bare existence. Insulin changed the picture over-

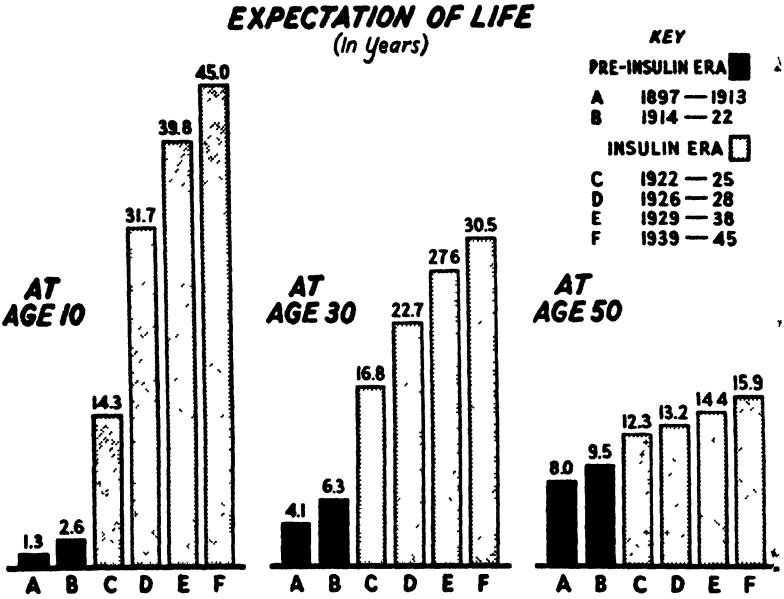

Chart 12. The increasing longevity of diabetics; experience of the George F. Baker Clinic, Boston, Mass., 1897–1945 (Excludes deaths within one week of first observation or hospital discharge.)

night; diabetic children can now do the same things as nondiabetic children. They can go to school and take part in all kinds of sports. They can plan careers, and they can later marry and have children.[2]

31. Do all diabetics need insulin?

Virtually all diabetic children and most young adults with the disease need insulin. The proportion requiring the drug is less at the older ages, when the disease is more easily controlled by diet and exercise. Many patients with mild diabetes, however, who are not on insulin would be better off if they used it and ate more. All diabetics should know how to use insulin so that they can take it in an emergency.

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[2] See answer to Question 26 of Chapter XIX, page 301.

32. What is meant by a diabetic diet?

Because the diabetic is unable to utilize sugars and starches his diet contains a restricted amount of carbohydrates. Under present methods of treatment the restriction is moderate. Diabetic diets today generally contain about half as much carbohydrate as a normal diet, or between 150 and 250 gm a day, depending on the age and activity of the patient. Additional fatty foods, such as butter and cream, make up the deficiency in calories caused by the restriction on sugars and starches. A good diabetic diet is well balanced and includes all the essential vitamins and minerals. Diabetics do not need special foods. The dishes they eat are no different from those eaten by other people, but the size of their servings of some foods may be different. Diabetics must obviously avoid rich pastries, desserts, ordinary canned fruits, and candies. Above all, they need to learn the proportions of carbohydrate, protein, and fat, as well as the number of calories in given portions of various foods. Many physicians recommend weighing foods, particularly at the beginning of treatment.

33. How is insulin taken?

Insulin can be taken only by injection under the skin with a hypodermic needle. It cannot be taken by mouth because digestive juices destroy it. Virtually all patients can learn to inject themselves; even children can do it with proper instruction. With the present types of insulin, those who require it should take it every day. In most cases, a single daily injection is sufficient; but in some cases, particularly in children, more than one may be necessary. The site of injection has to be varied systematically.

34. Is insulin habit-forming?

Insulin is not a narcotic. It is a substitute for the insulin which the body would normally produce. Even though patients take it every day, it cannot be considered habit-forming in the sense that narcotic drugs are. In fact, improvement in the patient's condition may even bring reduction in the insulin dosage or, in occasional cases, eventual elimination of its use.

35. Can diabetes be cured?

For all practical purposes, diabetes cannot be cured. In some cases the disease may become so mild that it is well controlled by moderate dietary restrictions alone. This is particularly true for overweight diabetics in middle and later life. After reducing their weight to average or less than average levels, they may show normal blood and urine tests. But even in such cases resumption of overeating usually results in a return of the disease, sometimes in severer form than when originally discovered. For all intents and purposes, patients of this kind must be considered diabetics who are well controlled as long as their weight is brought down and kept down. In some instances of reputed cures, the original diagnosis may have been faulty or there may have been only a temporary disruption of normal metabolism. Some difficulty in diagnosis may exist, particularly in certain conditions such as pregnancy and toxic goiter which are characterized by glandular stresses or maladjustments, either temporary or prolonged.

36. What are the major complications of diabetes?

The most serious complications are diabetic coma and insulin reactions. Diabetic coma, which usually involves loss of consciousness, is brought on by taking too little insulin or too much food. It may be precipitated by an infection. If the insulin deficit is made up promptly, and the patient is properly cared for, complete recovery is the rule. Because of insulin, diabetic coma is far less important today than it once was. In the large experience of the George F. Baker Clinic in Boston, only 1 percent of all the diabetic deaths are now due to coma, in contrast to 64 percent in pre-insulin days.

An insulin reaction is the opposite of coma. It is caused by too much insulin or too little food, and it also may bring on unconsciousness. A blood sugar test and two urine tests can determine within a half hour whether a patient is suffering from diabetic coma or insulin reaction. Most reactions can be quickly cured by administering sweetened fluids or sugar.

The circulatory system of diabetics, particularly of those who are inadequately treated, tends to degenerate earlier than that of nondiabetics. Changes are found in the heart, brain, kidneys, and in the lower extremities. The most characteristic complication of this kind is probably diabetic gangrene. Before insulin was discovered, the major surgery required in cases of gangrene was so hazardous to diabetics that it was not often tried. Now, not only can this surgery be done with less risk, but new methods of determining the efficiency of the circulation have removed the need for many major amputations. Even more important, better management of diabetes and careful instruction of patients on how to prevent gangrene has cut down the frequency of this complication.

Most deaths of diabetics today result from degenerative changes in the heart, brain, and kidneys. The death rate of diabetics from these conditions is at least double that of persons of comparable age in the general population. It is not known why diabetics develop these ailments earlier than nondiabetics, nor why they experience such rapid progression in them. Intensive studies of this problem now under way may throw light on the causes which lead to the hardening of the arteries and other evidences of aging.

37. How can the major complications of diabetes be prevented?

Diabetic coma will seldom occur if a patient is under good medical supervision and follows the rules of treatment. If this complication threatens, however, it may be prevented by using insulin according to the doctor's orders. Insulin reactions are best prevented by regularity in taking meals. Patients using slow-acting insulin may need additional snacks between meals and before going to bed. Repeated reactions require that the patient's whole regimen be reviewed. The prevention of gangrene is largely a matter of meticulous care of the feet and the avoidance of any injury to the feet or the circulatory system. For example, new shoes should be fitted properly and broken in slowly, and circular elastic garters should not be used. No specific measures are known for the prevention of the other arterial complications of diabetes, but in general their progress may be slowed by careful adherence to treatment and by the maintenance of weight at or below the average level. The relatively high fat content of the diabetic diet may be harmful, and there is a tendency to reduce it.

38. Does diabetes interfere with working activity?

Well controlled diabetics can generally carry on as they did before their disease began and as do nondiabetics of the same age. Consequently, most diabetics may be considered to have an unimpaired working capacity. Practical considerations, however, may sometimes make it advisable for such people to adjust the duties of their job or to change jobs. This applies specifically to types of employment in which there is a potential hazard to the diabetic as well as to others. For example, running a locomotive is not a desirable occupation for a diabetic who requires a large insulin dose to control his disease, even though many diabetics work at equally responsible jobs without harm to others.

39. What should be the policy of employers with regard to the employment of diabetics?

For the most part the policy pertains to men or women who are already on the job and have seen many years' service These people are usually valuable employees because of their age and experience. There is no question that the great majority can and should be retained in service, although as already indicated, it may be desirable in certain situations to shift them to other jobs. Diabetics seeking employment should be given every consideration, particularly those who are under good medical supervision and take good care of themselves. While selective placement in jobs is desirable, there are very few jobs in business and industry which diabetics of working age cannot fill satisfactorily, if they are qualified.

40. Are diabetics insurable?

Many insurance companies accept diabetics, but these are companies which insure categories of risks with higher than average mortality. Even so, the selection of the diabetics that are accepted is very rigid, and the rejection rate is quite high. It is important for diabetics who seek life insurance to know that the major considerations are the faithfulness with which they follow the prescribed treatment, the quality of medical supervision they are under, and the regularity of their habits, as well as their actual physical condition at the time they apply for the insurance.

41. Should diabetics marry?

There is no reason why diabetics should not marry, but the diabetic contemplating marriage should not conceal from his prospective mate either the fact of his diabetes or the knowledge of any limitations imposed on him by the disease. It is also advisable for a diabetic to avoid marrying into a family where diabetes exists because of the greater likelihood that offspring of such a marriage would eventually become diabetic.

42. Should diabetics have children?

Diabetic women can bear healthy babies safely, but it is extremely important that they get good prenatal care in early pregnancy. There may be special hazards for the baby which may be prevented or overcome by expert supervision during pregnancy and at delivery.

43. Is it safe for diabetics to drive a car?

Most diabetics may be permitted to drive, but there are certain extra precautions that the diabetics should take for his own sake as well as for the sake of others. If he uses insulin, he should take a snack when driving, such as a couple of crackers or an orange every hour or two in order to avoid insulin reactions. He should also have his vision tested regularly so that any changes can be corrected promptly. A diabetic should not drive at any time he feels ill. He must also rigidly adhere to the rule never to take alcohol before or during a drive.

44. What should you do if you suspect diabetes?

You should visit your doctor promptly so that he may determine whether or not you have the disease. If he discovers that you have the disease, you will benefit from having it diagnosed as early as possible. If you do not have it, such reassurance will be of value.

45. What are the advantages of early diagnosis?

Early diagnosis of diabetes means prompt treatment; this is the only way to prevent serious complications from the disease. Thus, early diagnosis can mean not only better health and vitality, but also less interference with normal working capacity and other activity. The benefit of early diagnosis in diabetes is illustrated by the experience of patients of the George F. Baker Clinic. Among patients who, at first visit, showed insignificant or no other impairments beside their diabetes, the death rate was less than one-third that of patients with serious impairments or diabetic complications when first seen.

46. What steps are being taken by government and voluntary health agencies to combat diabetes?

The United States Public Health Service, as part of its chronic disease program, has a separate section on diabetes and also supports research on diabetes. The Diabetes Branch conducts such activities as case-finding projects, the development of educational materials for the use of patients and physicians, and demonstrations in teaching diabetic patients and in other aspects of the disease. As part of its case-finding activities it has developed new laboratory techniques that permit mass blood sugar tests to screen out quickly those who require further study. The Diabetes Branch works closely with local professional groups and health authorities, and also with the American Diabetes Association.

The American Diabetes Association, whose membership of more than 1,000 consists chiefly of physicians interested in treatment or research in diabetes, is the leading voluntary organization in the field. Its chief objectives are twofold: to improve the diagnosis and treatment of diabetes by physicians; and to educate the laity in the early recognition of the disease and the importance of regular medical supervision and cooperation with the physician. A major activity has been to stimulate the formation of professional and lay diabetes societies over the country. The association publishes a professional journal, *Diabetes Abstracts*, which contains brief summaries of scientific articles on the disease and related subjects, and a magazine, *A.D.A. Forecast*, which contains articles written largely by physicians, for the guidance and information of diabetic patients and their families. In order to promote public interest in early detection of the disease, the association has inaugurated a year-round Diabetes Detection Drive which is opened each year by a Diabetes Week.

An increasing number of state and local health departments are organizing programs in diabetes control. In a few places, other types of voluntary health agencies, such as tuberculosis associations, have extended their operations into this field. A few life insurance companies also have diabetes educational programs for physicians, patients, and the general public.

XI

A DIMINISHING BURDEN—PNEUMONIA AND INFLUENZA

1. What are pneumonia and influenza, and why are they usually linked together?

Pneumonia and influenza are the only acute diseases still remaining among the major causes of sickness and death in this country. Both are highly infectious respiratory conditions with relatively sudden onset and a short severe course. Influenza is a virus infection of the upper respiratory tract. Pneumonia is an infection of the lung by bacteria, the most common being the pneumococci, of which a great many varieties have so far been identified. "Primary atypical" pneumonia is caused by a number of forms of virus.

These diseases are referred to jointly in medical literature because they are often linked together in experience. Influenza is normally much milder than pneumonia and by itself is seldom a cause of death. The greatest danger in influenza is from the complications, of which pneumonia is the most serious. A great many of the deaths attributed to influenza are actually the results of the secondary effects of pneumonia. To enhance comparability of their mortality over the years, these diseases are grouped together in the study of time-trends.

2. What is the annual death toll from pneumonia and influenza in the United States?

In 1948, there were 56,000 deaths from pneumonia and influenza, and the death rate was 39 per 100,000 population. This combination of diseases accounted for 4 percent of all deaths.

3. How many cases of pneumonia and influenza are there annually in this country?

Although both pneumonia and influenza are on the lists of diseases to be reported to public health authorities in most states and territories, the records of the number of cases, especially in a mild year, are very sketchy. Influenza is usually so mild a disease and is so often confused in the public mind with the common cold, that many cases do not even receive medical care. The number of cases in any year is, therefore, not known, and it would be futile to make an estimate. As regards pneumonia, it is believed that at least half a million persons a year come down with one form or another of this disease.

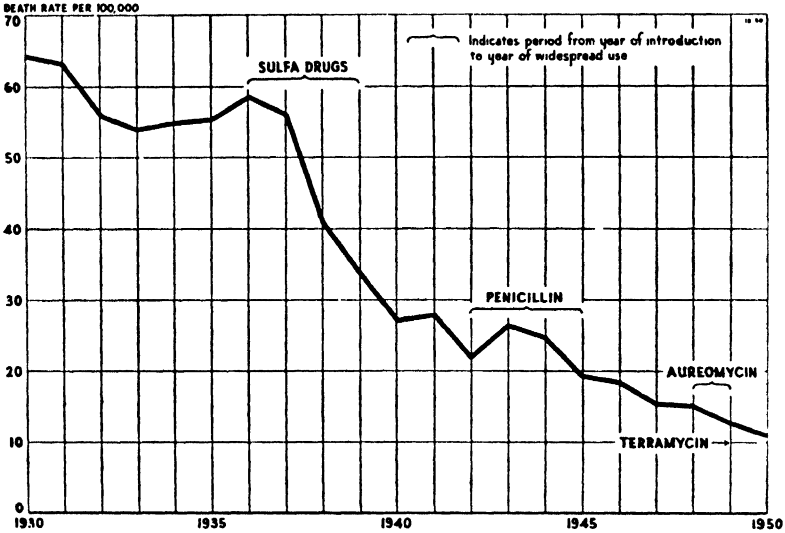

Chart 13. Standardized death rates per 100,000 from pneumonia, total persons, ages 1–74 years. (Metropolitan Life Insurance Company, weekly premium-paying business, 1930–1950.)

4. How does this country compare with others in mortality from pneumonia and influenza?

Only New Zealand has had slightly lower death rates in recent years from pneumonia and influenza (combined) than the United States. For a long period before World War II, many of the countries of Western Europe—England and Wales, the Scandinavian nations, Holland, France, Germany, and Switzerland—were about on a par with this country, while the Southern and Eastern European nations on the whole lagged far behind with much higher rates.

5. How do pneumonia and influenza rank among the causes of death in the United States?

Pneumonia and influenza are still among the leading causes of death in this country. In recent years, they have been outranked in mortality only by heart disease, cancer, cerebral hemorrhage, nephritis, and accidents. In 1900, however, pneumonia and influenza held the first place.

6. What has been the trend in mortality from pneumonia and influenza since 1900?

The death rate from pneumonia and influenza dropped from 202.2 per 100,000 population in 1900 to 38.7 in 1948, a decline of 81 percent. During the first quarter of the century, the fall in mortality averaged around 1 percent a year and reflected largely the general improvements in medical care and advances in the standard of living. No specially effective pneumonia treatment was then available, and none has even yet been found for influenza. In the late 1920's the antipneumonia sera (a different one for each of the major types of pneumococcus) were introduced in the United States and from 1930 to 1938 the decline in mortality from these respiratory diseases averaged 2½ percent a year. Toward the end of the decade, sulfa treatment for pneumonia was adopted, and still later, at the end of World War II, penicillin was used; more recently, many other antibiotics have been effective against pneumonia. As a result of drug therapy, the decline in the pneumonia and influenza death rate since 1938 has been about 5 percent per year. (See Chart 13 on page 162.)

7. In terms of lives saved, what does the reduction in mortality from pneumonia and influenza mean?

Instead of about 50,000 lives lost a year now because of pneumonia and influenza, about 350,000 would be lost if the death rates of 1900 had continued. In other words, each year 300,000 lives are being saved that might have been lost under the conditions of fifty years ago.

8. What are the different forms of pneumonia and influenza, and how do their death rates compare?

There are two clearly identified forms of influenza—types *A* and *B*—distinguished by the kind of virus which causes them rather than by the symptoms of the diseases. The chief forms of pneumonia are lobar, usually a primary disease which attacks the lobes of the lungs; bronchopneumonia, more often a secondary disease attacking the lungs and bronchi of persons already weakened by other complaints; and virus pneumonia, which is a primary disease and normally much less severe than lobar or bronchopneumonia.

Ninety percent of the deaths from pneumonia and influenza in 1948 were pneumonia deaths, and 10 percent were influenza deaths Almost two-thirds of the influenza deaths were in cases with respiratory complications, which usually means bronchopneumonia. Of the pneumonia deaths, bronchopneumonia accounted for slightly more than half; lobar, for about three-eighths; and the remaining forms and the unspecified types for less than one-eighth. Virus pneumonia caused only one-fiftieth of all pneumonia deaths in 1948, but it constituted a much greater share of the pneumonia cases.

9. Is pneumonia a common contributory cause in deaths from other diseases?

The importance of pneumonia as a cause of death cannot be gauged alone from the cases in which it is reported as the killer. In 1940, for example, 72,000 deaths in the United States were attributed to the pneumonias, but in 47,000 other deaths pneumonia was listed as an associated cause. Pneumonia was officially recorded as contributing to 20,000 deaths from the cardiovascular-renal diseases, nearly 5,000 violent and accidental deaths, and only slightly fewer cancer deaths.

10. Is pneumonia a contagious disease?

Not only is influenza, which so often precedes pneumonia, highly contagious, but so is pneumonia itself. It occasionally sweeps through such groups as families, children in the same school, and soldiers living in the same barracks. Studies have shown that from 80 to 90 percent of the healthy members of the population have pneumonia germs present in their mouths, but these are, as a rule, relatively nonvirulent. Just how the virulent bacteria are spread is not yet clear. It is believed that they may be transmitted by "carriers," apparently healthy individuals who harbor the infecting agent. In general, it has not been possible to trace the source of infection in pneumonia outbreaks.

11. At what ages is mortality from pneumonia and influenza highest and lowest?

Pneumonia and influenza take their greatest toll in infancy and old age, particularly the latter. During childhood and early adult life, mortality from these diseases is extremely low today. The rate for children aged 10 to 14, for example, was 3.3 annual deaths per 100,000 individuals in 1948; the rate for those less than a year old was 399; and for those 75 and over was 471. From childhood on the rise in death rates is only nominal until middle age; it increases rapidly only after old age is reached.

12. What ages have benefited the most from the reduction in mortality from pneumonia and influenza during the past half century?

The reductions in mortality were relatively greatest among children one to four years old and among young adults up to 35 years of age. In these groups, mortality from pneumonia and influenza was cut by more than 90 percent during the 50-year period. At the extremes of age, where mortality from these diseases has been the highest, the improvements have been somewhat less.

13. How do male and female death rates from pneumonia and influenza compare?

Males have higher death rates from these diseases than females all through life, except at a few ages where the mortality from pneumonia and influenza is at its minimum, and the difference between the two death rates is negligible. The largest difference comes in middle age, from 40 to 64 years, when men have about double the mortality of women. The sex differential in pneumonia and influenza in adult life is partially explained by the greater exposure of men to environmental and occupational hazards that provide fruitful ground for these diseases.

14. Do pneumonia and influenza death rates vary with marital status?

The married have lower death rates from these diseases than the unmarried at practically all ages. This is true for both sexes, but married men have a greater advantage over bachelors than married women over single women. In 1940, married men from 25 to 44 years old had death rates from these diseases only half as great as single men, while married women of the same ages had rates from two-thirds to three-quarters those of single women.

15. How do the death rates from pneumonia and influenza for white and colored persons compare?

The over-all death rate from pneumonia and influenza among the colored is about twice as high as among whites. For some age groups in early adult life the colored rate is three to four times the white rate.

16. How sharply does pneumonia and influenza mortality fluctuate with the seasons?

Mortality in winter months has normally been at least twice that in midsummer. Although the drug treatments for pneumonia have brought down the annual mortality from these infections, these diseases are still definitely seasonal in nature.

17. Does climate make a difference in pneumonia and influenza mortality?

Within the United States, climate does not seem to make much difference, although sudden variations in weather may.

18. Are there regions within the United States which have especially high death rates from pneumonia and influenza?

There are two such regions, one in the South and one out West. The first includes Alabama, Arkansas, Georgia, Kentucky, Louisiana, Mississippi, South Carolina, Tennessee, and Texas. The second contains only Arizona, Colorado, Nevada, and New Mexico.

These regional variations may be due to a variety of circumstances. In the West there is a fairly large group of American Indians who have an exceptionally high pneumonia and influenza mortality. Some states, like Arizona and Colorado, which cater to the tuberculous, have death rates from pneumonia and influenza which are artificially swollen by many chronically ill patients from other areas. In the South, the presence of a large Negro population also tends to raise the death rate.

19. Do cities have lower pneumonia and influenza death rates than rural areas?

The death rates from pneumonia and influenza are generally lower in large cities, where hospitals and expert medical care are more likely to be available, than in small towns and villages. In 1940, for example, mortality from these acute respiratory infections in communities of 2,500 to 10,000 persons was about one-fifth higher than the rate for cities of more than 100,000. Rural areas had rates slightly lower than small communities, but higher than cities of 10,000 and over.

20. Do some occupations involve unusual dangers from pneumonia and influenza? [1]

21. What part do general environmental factors play in pneumonia and influenza?

Everything affecting a person's general state of health influences his susceptibility to pneumonia or influenza. Many surveys, both here and in England and Wales, have revealed the tendency for both incidence and mortality to rise as one approaches the lower end of the social-economic scale. The National Health Survey of 1935–36 in this country showed that adults from 25 to 44 years old who were on relief had a pneumonia incidence almost two and a half times as high as those with incomes of at least $2,000 a year. The effect of economic status on both incidence and mortality is most marked at the lowest income levels. One of the ways in which a poor standard of living affects health is through housing. In special studies of housing, the highest pneumonia and influenza death rates were among those living under the most crowded conditions.

22. Is pneumonia especially dangerous to alcoholics?

The case fatality rate in pneumonia is much higher for alcoholics than for nondrinkers. In one survey, the rate for alcoholics was more than twice as high as for nondrinkers or those who took only an occasional drink. The rate for moderate drinkers fell about halfway between.

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[1] See answer to Question 29 of Chapter XVIII, page 283.

23. Do epidemics and pandemics of influenza recur in cycles?

Influenza, with its secondary pneumonia, has long been recurring in epidemics and pandemics. The cyclical, as distinct from seasonal, nature of its outbreaks has puzzled epidemiologists, and only recently have theories been worked out which seem to account for most of what has happened. Today it is generally accepted that type *A* and type *B* influenza vary independently, though both may on some occasions be present in the same epidemic. Type *A* has a cycle of two or three years, and type *B* about twice as long. The interepidemic disease is believed to be basically the same as epidemic influenza but caused, possibly, by a less virulent strain of virus, or perhaps kept in check by a population having temporarily greater immunity. Pandemics of calamitous proportions also recur at intervals, but are much less regular in their appearance. The relation of the infecting agent in pandemic influenza to that of the nonepidemic disease is not known because there have been no pandemics since the isolation of the influenza viruses.

24. How extensive was the 1918 influenza pandemic?

The 1918 wave of influenza accompanied by secondary pneumonia killed an estimated minimum of 20 million individuals throughout the world, considerably more than the war which immediately preceded it. An estimated 200 million contracted the disease. In this country, about 20 million came down with influenza and 550,000 died. It is probable that some of the high mortality of the 1918 outbreak may be blamed on the war, which had devastated large sections of Europe and worn down millions of people with years of malnutrition and suffering. Medical literature contains stories of whole towns laid waste within a few weeks or months by the pandemic, which was as severe in some areas as the medieval plagues. The virulence and explosiveness of the outbreak have been the subject of a great deal of study because it was the only experience of its kind in modern history. The epidemics which used to ravage nations and continents occurred largely before the development of the modern science of medicine.

25. Did the 1918 outbreak change the age and sex distribution of influenza and pneumonia deaths?

Instead of a low death rate from these diseases in early life, the 1918 pandemic had a peak in mortality among those 25 to 34 years old which was exceeded only by that among persons 75 and over. Not only were very many young persons stricken, but in this country the healthy and vigorous seemed particularly susceptible. Although men had previously had higher mortality than women, the difference in rates was increased still more by the pandemic.

26. Do epidemics of influenza and pneumonia generally follow the pattern of the 1918 outbreak?

There has been great variety among epidemics. Most have resulted in greatly increased mortality among young adults, but some have raised the death rates almost equally for all ages. In general, the old and adults between the ages of 20 and 30 have been hit hardest by epidemics.

27. Did the 1918 influenza pandemic affect mortality from other diseases?

The combined mortality from all causes of death was one-third higher for 1918 than for the five preceding years. This was not only the result of the greatly swollen influenza and pneumonia toll, but also because of increased death rates from a number of other diseases, particularly the chronic and degenerative diseases. Tuberculosis, heart disease, and nephritis death rates went up during the pandemic, and then dropped sharply right afterward. The subsequent fall was temporary for heart disease and nephritis, but tuberculosis mortality continued to decline.

Other epidemics of influenza and pneumonia have also raised the death rates of diseases outside this group, but this is not invariably the case. In the epidemic of 1928–29, most of the excess deaths were influenza and pneumonia deaths. In the epidemic of 1943–44, the excess mortality in 35 cities was found to be largely attributable to other causes. Less than a third of the additional deaths were recorded as having been caused by influenza or pneumonia.

28. How did the 1918 outbreak affect women who were pregnant?

Although in general the epidemic concentrated on men more than women, the death rates for causes connected with pregnancy were sent up about 40 percent. It was not the usual causes of death in pregnancy—puerperal septicemia and the toxemias—which rose, but rather the so-called accidents of pregnancy, miscarriage, and premature birth. As a matter of fact, the death rates from septicemia fell off during 1918.

29. Has there been any change recently in the frequency or severity of influenza outbreaks?

There has been little change in the frequency of influenza outbreaks since 1918, but there has been a great change in the severity. There were epidemics or at least relatively severe waves of influenza in 1923, 1926, 1929, 1931, 1933, 1937, 1939, 1941, 1944, and 1946. As the quarter century progressed and drug therapy was more widely used, the successive waves became smaller, standing out from the surrounding years but not attaining the severity of preceding periods.

Drugs may not yet be able to prevent people from contracting influenza, but they can help to keep many of those so affected from dying. Since World War II there were mild waves of influenza in this country, while in many parts of Europe there were more serious outbreaks. It is noteworthy that in this country there was a large supply of sulfa drugs and penicillin at that time, while in Europe, where mortality went up so sharply, these medicines were relatively rare.

30. Are there ways to immunize persons against influenza and pneumonia?

There are vaccines for immunizing persons against both influenza and pneumonia, but so far they are effective against only a limited number of types of these diseases and the immunization is relatively short-lived.

One of the greatest problems in immunization is the wide variety of organisms which can cause these diseases. Influenza is generally believed to be caused by either type *A* or type *B* virus. But of either type there may be a large number of different strains. A special vaccine must be made up for each new strain, or the strain must at least be included in the regular vaccine. Since there seems to be no limit to the number of possible strains, while there is a definite limit to how many may be included in one vaccine, immunization against the disease has obvious practical difficulties. However, recent experiments have shown that it is possible to prepare vaccines against some strains soon enough to meet the immunization needs while an epidemic is in progress.

The problems in pneumonia are similar. Vaccines have been made up with great difficulty from groups of the more common pneumococci, and in a few wartime trials they had some success. They are, however, still experimental, and their effectiveness has not been proved.

31. What preparations have been made to combat future epidemics?

After World War II, the World Health Organization set up an International Influenza Center in London. Many countries, including the United States, are cooperating by organizing their own local influenza information services to detect new outbreaks and identify the infecting virus. The idea is to determine the specific strain of influenza causing any new epidemic before the disease has had much chance to spread. It may then be possible to incorporate the newly identified strain in influenza vaccine and perhaps, by immunization, limit the extent of the epidemic. In this country a National Influenza Strain Study Center in New York City has been designated to handle the main technical work, with laboratories throughout the nation, including one each in Alaska, Hawaii, and Puerto Rico, reporting to it.

32. Are we likely to have another influenza pandemic like that of 1918?

The possibility of such a pandemic will be with us until a way is found to create general immunity to influenza and to treat the disease. Many public health authorities believe influenza could again ravage this country and kill hundreds of thousands in a few months. The standards of health and living maintained here are no guarantee of protection, and the relative freedom from severe influenza that this nation has enjoyed recently means there is a large section of the population which has had no opportunity to build up a natural immunity.

Influenza is no respecter of boundaries nor have oceans in the past served as barriers to its spread. If a serious outbreak got started again, it might well travel over the entire world, as it did three decades ago.

It is true that we now have the sulfa drugs and penicillin to use against the secondary pneumonia in influenza outbreaks, but unfortunately sulfa- and penicillin-resistant strains of bacteria are known to develop when the drugs are used a great deal. A type of infection against which these drugs were of little use might conceivably be the one to cause the next epidemic. Nevertheless, we are in much better shape to combat the next severe outbreak if and when it comes.

33. At what stage in the development of pneumonia is drug treatment most effective?

The sooner treatment is begun, the greater the chance of recovery. Increasingly large sections of the lungs may become involved as pneumonia progresses. In chemotherapy it has been found that the case fatality rate was generally much lower for those treated early in the course of the disease than for those who had been sick for the greater part of a week or more. In one study of 15,000 cases, the case-fatality rate was twice as high for patients treated after the fourth day of illness as for those treated earlier.

34. Is research on pneumonia and influenza being concentrated now on immunization?

While both cure and immunization are the subjects of many current research projects, it is probably true that the emphasis has recently shifted from treatment to prevention. The antibiotics and sulfa drugs have proved so effective in the pneumonias that the most immediate need seems to be for a useful preventive vaccine. In the case of influenza, both a method of treatment and a method of effective immunization are being sought.

One field of research which is receiving special attention is that of cross immunization. Attempts are being made to find a way to build up immunity against a variety of types of bacteria or virus with sera prepared from many types. If this were possible, it might result in a single or a small number of vaccines which would provide immunization against all influenzas and a single or limited number effective against all pneumonias.

35. What are the chances of eventually dying from pneumonia or influenza?

The chances of a white baby eventually dying from pneumonia or influenza were about 35 in 1,000 under mortality conditions of 1948. The probability of dying from these infections did not vary greatly with age.

36. What is the outlook for improved control of pneumonia and influenza?

Barring severe epidemics, the recent sharp drops in mortality from pneumonia and influenza may be expected to continue for a time even without further medical advance. The new drugs are becoming more readily available and the rising standard of living means that these diseases are no longer being spread as easily as they once were. In the long run, however, control depends on more medical progress and on better public health work. With the medical profession of the country, as well as the health agencies of the federal, state, and local governments, alert to the dangers of pneumonia and influenza, it seems almost certain that further great scientific advances will be made in combating these two respiratory diseases.

XII

AN INCREASING BURDEN— THE CIRCULATORY DISEASES

1. What are the major diseases of the circulatory system?

The major diseases of the circulatory system are the various forms of heart disease (including coronary artery disease), high blood pressure, general arteriosclerosis (hardening of the arteries), and cerebral hemorrhage (apoplexy). The major diseases of the circulatory system are frequently studied jointly with the chronic diseases of the kidneys, although anatomically they are separate. It is convenient to consider these various conditions together since they are generally associated with the aging process; the term "diseases of the circulatory system" is used with this understanding in the rest of this chapter. With advance in age, the heart, blood vessels, and kidneys tend to lose some of their elasticity and adaptability. Since these organs are closely related, any derangement in one of them may ultimately affect the others. The interrelationship of these organs in disease is also evidenced by the great frequency with which they are reported together on death certificates.

2. How does the heart do its work?

The heart is a muscle about the size of a fist. It is divided by a muscular wall down the middle into two main divisions—a right and a left. Each division has two chambers which work together as a unit. The right side of the heart receives blood from the body through two great veins and pumps it to the lungs where, first, it gives up the carbon dioxide (a waste gas) it collects from the cells of the body, and then accumulates oxygen to bring back to the cells. The return flow is from the lungs into the left side of the heart. From here, the contractions of the heart muscle pump the blood through a great artery which leads into an intricate system of lesser arteries, and tiny branches called capillaries that reach into all parts of the body. The capillaries are a particularly important part of the circulatory system since it is through them that the exchange of nutritive substances and oxygen for waste products takes place.

3. What are the major causes of heart disease?

Heart defects may be either structural or functional in nature, and have a variety of causes. A small, but important fraction of the heart diseases are congenital in nature; that is, they are defects with which some babies are born. It has recently been found that such defects may arise in cases where the mother had German measles during very early pregnancy. There are some congenital defects of the heart and blood vessels for which surgery now offers help and, sometimes, cure. Most heart diseases found in children and the younger adults, say up to about age 40, have their origin in a childhood attack of rheumatic fever.[1] A sizable proportion of heart disease manifesting itself from about ages 40 to 50, and even later, is a consequence of a syphilitic infection, usually acquired in early adult life. With newly developed treatments, syphilis can now be controlled before it has a chance to damage the heart or blood vessels. Heart disease in association with high blood pressure is most commonly found from about ages 40 to 60. Arteriosclerosis (the hardening of the arteries), which is often associated with high blood pressure, is by far the leading cause of heart disease in old age.

4. How do diseases of the coronary arteries affect the heart?

The heart receives its nourishment not from the blood in its chambers but through the coronary arteries. When these blood vessels become constricted because of the thickening of the walls or because of the accumulation of deposits, the blood supply to the heart is diminished. The effect of this interference may become noticeable when a person with such condition attempts any unusual physical activity. At that time, the heart works harder and it requires more blood for its nourishment. The lack of ample blood supply is made evident by sudden sharp and oppressive pains in the left side of the chest that last just a few minutes; this sensation has been called "angina pectoris." When a coronary artery is suddenly closed, the condition may be either a coronary thrombosis or a coronary occlusion. Contrary to popular impression, most persons live through their first coronary attack.[2]

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[1] See answer to Question 6 of Chapter XIII, page 195.

5. How many people suffer from the circulatory diseases?

According to a recent estimate by the United States Public Health Service, there are about 5,000,000 persons in our country with heart disease, 4,600,000 with high blood pressure or arteriosclerosis, and 950,000 with kidney disease. Altogether, there are about 9,200,000 persons with some circulatory disease, many with more than one of these conditions. The estimates are based upon field surveys and may considerably understate the number of existing cases.

6. Does the prevalence of the circulatory diseases rise with advance in age?

According to the National Health Survey, about 1 percent of the people at ages from 15 to 24 years have some circulatory disease. The proportion rises to 5 percent at ages 45 to 49, to 16 percent at 65 to 69 years, and to almost 25 percent after age 75. It is interesting to note that whereas over three-fifths of those with circulatory disease at ages 15 to 24 had little or no restriction of their usual activities, less than half of those at ages 65 and over could follow their ordinary pursuits.

7. What is the annual death toll from the circulatory diseases?

There were about 707,500 deaths attributed to the circulatory diseases in the United States in 1948. This number constituted nearly one-half of all deaths in that year. The heart diseases accounted for 471,469 deaths, or for two-thirds of the mortality from the circulatory diseases. Cerebral hemorrhage was responsible for nearly one-fifth of the deaths in this group, nephritis for one-tenth, and arteriosclerosis and high blood pressure for the remainder. Not only do the circulatory diseases as a group far outrank every other cause of death, but the heart diseases alone lead every other cause by a wide margin.

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[2] See answer to Question 25 of this Chapter, page 183.

8. How has the proportion of deaths due to the circulatory diseases changed in recent years?

In 1900, only one-fifth of all deaths were ascribed to the circulatory conditions. The proportion rose to more than one-fourth by 1920, and to well over two-fifths by 1940. At present, the ratio is about one-half. Most of this rise in the proportion of deaths from the circulatory diseases results from the increasing proportion of older persons in the population and from the decreasing mortality from the infections.

9. How does the proportion of deaths from the circulatory diseases vary with age?

The circulatory diseases are a very minor item in the mortality of infants and children. In the age group 15 to 24 years, however, these conditions account for about one-tenth of the deaths from all causes combined. The proportion then rises steadily with advance in age. At 25 to 44 years it amounts to one-quarter, at 45 to 64 to one-half, and at 65 and over to almost two-thirds. The proportion of deaths from the circulatory diseases at the various periods of life is about the same for both sexes.

10. What has been the trend of mortality from the circulatory diseases?

Superficial examination of the figures indicates an upward trend in the mortality from the circulatory diseases in the past three decades. This rise reflects entirely the increasing proportion of older people in the population, among whom the mortality from the circulatory diseases is high. When allowance is made for the aging of the population, the mortality from these conditions is found to have declined. The reduction has been greatest at the younger ages, the rate of improvement decreasing progressively with advance in age among all but white males. The latter experienced increasing mortality rates at the main productive ages from about 35 to 65 years.

11. What are the important factors in the improved mortality from the circulatory diseases?

The circulatory conditions at the younger ages are largely of infectious origin, hence most of the improvement in mortality at this stage of life stems directly from increased control gained over the infections. Very much the same can be said for the reductions in early maturity and midlife, and particularly for heart disease of rheumatic origin. Modern treatment for syphilis has been a potent factor in lowering the mortality from syphilitic heart disease; further improvement will result from the use of penicillin and other antibiotics for early syphilis.[3] The reduced burden of childbearing has probably played a part in reducing the death rate from the circulatory diseases among women. Quite generally, there are the beneficial effects of better living and working conditions. We have the advantage of better and more medical care and services, improved quality and variety of food, and labor-saving machinery which has lessened the strain of manual labor.

12. What have been the trends in mortality for the various circulatory conditions and how are they to be interpreted?

Although the death rate from the circulatory diseases as a group has moved downward, that for heart disease has gone up. On the other hand, the rates for chronic nephritis and cerebral hemorrhage have declined continuously. This is indicated by death rates that have been adjusted to remove the effect of the aging of the population. The contrary trends for heart disease and for chronic nephritis and cerebral hemorrhage arise largely from changing diagnostic concepts. Thus, deaths which in years past would have been attributed to nephritis or cerebral hemorrhage are now being reported as due to heart disease as a result of revised concepts of the relation of high blood pressure to these conditions. Another illustration is edema (dropsy); many cases with this complication which were previously attributed to a renal condition are now ascribed to heart disease. In other words, for a proper understanding of the course of the death rates from the circulatory conditions it is necessary to search for the underlying factors that have contributed to the picture presented.

13. What is the probability of eventually dying from one of the circulatory diseases?

According to mortality conditions in the United States in 1948, the chances for white persons at age 30 were about 60 in 100. The chances increase with advance in age and are nearly 65 in 100 at age 60. The probability of eventually dying from a circulatory disease is about four times the probability of dying from cancer.

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[3] See answer to Question 33 of Chapter XIX, page 305.

14. How does mortality from the circulatory conditions in cities compare with that for rural areas?

For the country as a whole, there is a distinct gradation from relatively low to high mortality for death rates from the circulatory diseases with increasing size of community. The differences among cities of various population sizes are not appreciable, but between the cities as a group and the rural areas the differences are rather sizable. The higher mortality from circulatory conditions in urban areas may reflect in part the effect of city life.

15. Does mortality from the circulatory diseases vary geographically within the United States?

Among white females, there is a fairly definite pattern in mortality from the circulatory diseases, with the death rates highest in the Northeast, somewhat lower in the Southeast, still lower in the North Central states, and lowest of all in the South Central region; the Pacific Coast region tends to fall between the East and Central regions. For white males, the same geographic pattern as for the females is found only in the rural areas. In urban centers, however, the rates for white males are generally higher in the South than in the North, contrary to the situation for females.

16. How does mortality from the circulatory conditions among the married compare with that among the single, widowed, or divorced?

Married men have a much lower mortality from the circulatory conditions than do the unmarried. Women show a similar experience, but the difference is not as marked as for the men. In 1940, the mortality from the circulatory diseases among single men was 30 percent higher than that for the married; for the widowed the ratio was 72 percent higher and for the divorced nearly 90 percent higher. In the case of women, the ratio of mortality to the married was: single, almost 10 percent higher; widowed and divorced, 50 percent higher.

17. What is the risk of death from the circulatory diseases among overweights?

The risk of death increases very rapidly with the degree of overweight, much more so than for other causes of death. In one insurance experience, it was found that mortality from circulatory conditions among males overweight from 5 to 15 percent was 44 percent higher than that for those of normal weight; those overweight by 15 to 25 percent had double the mortality of normal weights. For causes other than the circulatory diseases, the mortality ratio was 10 percent higher for the first group of overweights and 20 percent higher for the second.

18. What is the significance of the recent rise in mortality from diseases of the coronary arteries?

The recorded death rate from diseases of the coronary arteries in the United States has gone up rapidly from 7.9 per 100,000 in 1930 to 109.9 in 1948. Some of this rise is a direct consequence of the increasing proportion of older people in the population among whom this disease takes its largest toll. But by far the greatest part of the rise is due to the increased alertness of physicians to detect diseases of the coronary arteries and to record the information on the death certificate. In view of this situation, the extent of the actual rise in mortality from coronary disease—if, indeed, there is any at all—cannot be ascertained.

19. What do heart murmurs signify?

To the examining physician any unusual heart sounds—that is, heart murmurs—are a signal that there may be some abnormality in that organ. However, many heart murmurs are not indicative of any significant deviation from the normal heart. The physician judges the significance of the murmur by its characteristics, such as the area of the heart where it is heard, the loudness of the murmur, whether or not it is transmitted to other areas, the phase of the heartbeat at which it is heard, the quality and constancy of the sound, and other considerations. Serious murmurs may indicate, among other things, a leakage or obstruction of a valve of the heart or of the great artery leading from the left side of the heart to the body. To make up for such deficiencies the heart must work harder, and this tends to overdevelop the heart muscle. The extent of the overdevelopment increases in time. Even where there is no increase in the size of the heart, mortality tends to be high in the presence of the more serious murmurs.

20. What effect have unusual variations in rate or rhythm of the heart?

Normally, the heart of an adult male at rest beats about 72 times a minute; that of an adult female, 80 times.[4] The variations in the pulse rate about these averages may be fairly large without the presence of any physical impairment. However, where the pulse rate is extremely rapid, there may be a serious condition, such as either heart disease or hyperthyroidism. Mortality somewhat above average has been found among persons with very rapid pulse rates. Certain irregularities in the pulsation of the heart, such as skipped beats or variations in its rhythm, have also been associated with an excess in mortality.

21. What is blood pressure?

The force with which blood is pumped by the heart into the arteries exerts a pressure against their walls, causing them to stretch. This pressure is at its peak just after the blood has left the heart and it is known as the "systolic blood pressure." The pressure thereafter diminishes to a minimum until the next surge of blood is pumped by the heart into the arteries. At this low point, we have the "diastolic blood pressure." There may be rather wide variations in both the systolic and diastolic blood pressures in healthy adults.

The average systolic blood pressure is about 115 to 120 mm for persons in their 20's and rises gradually with age to about 140 to 145 mm at age 60. The average diastolic is about 75 mm at age 20 and increases to about 85 at age 60. The blood pressure of an individual, however, may differ to some extent from the average for his age and still be regarded as normal in the sense that he is able to follow his daily tasks. For the systolic blood pressure this variation may be as much as 15 to 20 mm above or below the average, and for the diastolic 10 to 12 mm above or below the average.

22. What is high blood pressure and what causes it?

High blood pressure or hypertension cannot be defined exactly, and authorities disagree as to the borderline which divides normal blood pressure from high blood pressure. However, most would consider as hypertensive readings of 30 mm or more above the systolic average and 15 to 20 mm above the diastolic average.

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[4] See answer to Question 29 of Chapter XXII, page 360.

The cause of high blood pressure in most cases is unknown, but in a sizable number the increased blood pressure is due to diseases of the kidneys and rarely to certain types of glandular disease. The blood pressure level is subject to many influences. At times it may become high temporarily, especially during excitement or under nervous strain. In this situation, nerves controlling the smaller blood vessels cause them to tighten and as a result the flow of blood into them becomes more difficult. Accordingly, the pressure in the arteries rises. In some persons, smaller blood vessels are constantly tightening up so that the blood pressure persists at a high level irrespective of the person's activity.[5]

23. What is the effect of high blood pressure on mortality?

High blood pressure has an adverse effect on longevity, largely because the extra work placed upon the heart often brings early breakdown of that vital organ. Death rates from heart diseases and from cerebral hemorrhage are high in people with high blood pressure. Mortality from Bright's disease is also high because the kidney is primarily involved in some cases of hypertension. Among carefully selected applicants for insurance, the mortality is increased even with moderate elevation of blood pressure, and the death rate shows a steady rise with increasing elevation of the systolic or diastolic pressure. However, high blood pressure may not be inconsistent with long life and a goodly measure of activity. Many patients who follow the rules laid down by their doctors are able to carry on effectively and lead virtually normal lives. Women particularly appear to tolerate high blood pressure.

24. What is low blood pressure?

There are no universally accepted standards for low pressure. Some physicians put the dividing line between normal and low at 90 mm systolic and 55 diastolic for adults. Others use limits of 100 to 110 systolic and 60 to 70 diastolic, or may vary the limits according to age.

Low blood pressure, except when it is a manifestation of a specific disease or condition, is generally favorable to longevity. Insurance studies have shown consistently that the death rate among persons with low blood pressure is less than that of persons with average blood pressure and far below those with high blood pressure. The favorable outlook for persons with low blood pressure reflects the decreased frequency of premature breakdown of the heart, blood vessels, and kidneys.

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[5] See answer to Question 35 of Chapter XXII, page 361.

25. How long do persons with arteriosclerotic or hypertensive heart disease live?

One study of nearly 500 patients with angina pectoris, all of whom have been followed up for at least 14 years, showed that more than one-fourth were living at the end of this period. In the longest case

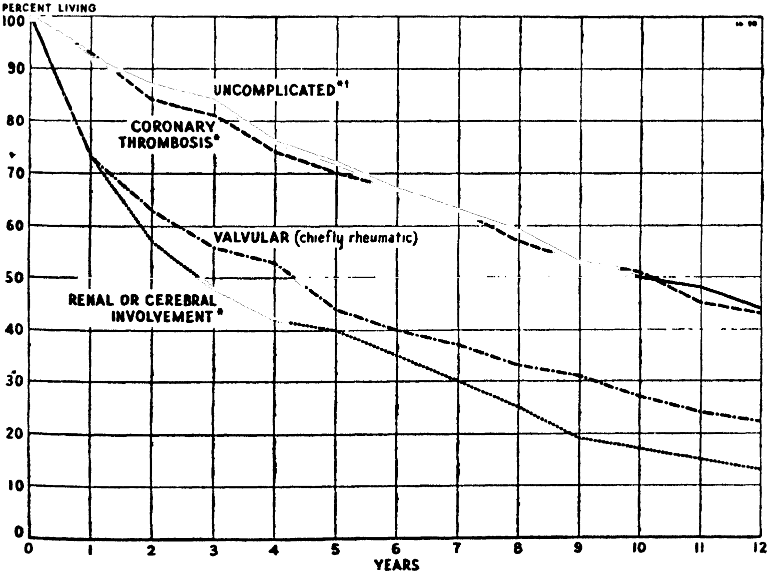

Chart 14. Survivorship of white men disabled by heart disease. Metropolitan Life Insurance Company, Ordinary Department. Disability cases reported and/or admitted in 1934–1936 and traced to anniversary in 1947.

* Arteriosclerotic and hypertensive.

† Excluding those with coronary thrombosis and with renal or cerebral involvement.

followed and still living, 32 years had elapsed since the attack. Another study, in which the over-all results were approximately the same, showed that the percentage surviving at the end of 15 years was approximately twice as great for females as for males. Favorable factors in the outlook of cases with these conditions were normal heart size and normal blood pressure.

The record for those who suffer heart damage as a result of coronary thrombosis is not as good. Even so, many of them live for several years and frequently recover sufficiently to resume their normal activities. Thus, in one group of patients 40 percent were living at the end of five years, and one-fourth at the end of ten years. When the mortality immediately following the attack is excluded it was found that 50 percent were living at the end of five years and over 30 percent at the end of ten years.

The experience of one life insurance company showed that among men so disabled by arteriosclerotic and hypertensive heart disease as to become eligible for total and permanent disability payments, 78 percent of those with uncomplicated disease lived for five years and 53 percent lived for ten years. Of those who had suffered a coronary thrombosis, about 50 percent were still living ten years later. (See Chart 14 on page 183.)

26. Is there any relation between heart disease mortality and occupation?

There are distinct differences in the mortality from heart disease among men in various occupations. Agricultural workers, skilled workers, and teachers, for example, have lower than average mortality from this cause. On the other hand, physicians, barbers, bartenders, and unskilled workers are at a distinct disadvantage in this respect. Differences in heart disease mortality may reflect, in part, the varying physical demands or mental stress of various types of occupations. In part, however, the differences in mortality are influenced by the fact that men with bad hearts will generally select jobs suited to their physical condition, that is, the lighter occupations. These occupations accordingly may have more than their share of cardiacs, not because they create them but because they attract them. The variations in heart disease mortality from one occupation to another may reflect also differences in economic status.

27. Do physicians have a relatively low or high heart disease death rate?

The heart disease mortality among physicians is nearly one-fifth higher than that for white males of the same ages. If the recorded death rate from diseases of the coronary arteries is considered alone, the physicians show an excess of about 80 percent. Part of this higher mortality may simply reflect the special opportunities for expert diagnosis usually available to physicians, with the result that the disease is discovered and recorded more frequently among them. Much of the excess mortality, however, is real and appears to result from the special activities and the strains physicians undergo.

28. Should a woman with heart disease bear children?

The term "heart disease" covers a wide range of cardiac conditions, from the mildest to the most serious. Whether a woman with heart disease should bear children depends upon the extent to which the heart is impaired. Pregnancy does put an added burden on the heart, yet many women with heart disease have a normal pregnancy and delivery. Women with serious heart defects, should seek expert guidance on pregnancy. The physician is in the best position to determine the risk involved in individual cases and his advice should certainly be sought. The cardiac who wishes to have children should also consider the added strain of caring for a child.

29. Does strenuous physical exercise damage the heart?

It is a common but erroneous belief that strenuous physical activity can damage the heart. The healthy heart can stand almost any physical exertion without being impaired. However, overexertion can prove fatal to the person with a diseased heart. Common examples are persons who die suddenly while playing tennis or running after a train. This is not to say that cardiacs should avoid all exercise. They should, however, adjust their activity according to their physical limitations.

30. Can people with heart disease work?

Most people with heart disease can work. The amount and type of activity permissible depends upon the nature and severity of the disease. Heavy manual labor would seldom be suitable for cardiac patients, although it is surprising to find that laborers engaged in such work often do very well despite serious heart defects. Young people with rheumatic heart disease need guidance and training in jobs so that they do not overtax their hearts. Middle-aged and older men and women who have angina pectoris or have recovered from a coronary thrombosis can often carry on with little difficulty in suitable jobs. In fact, one study of patients who had survived at least one year after a coronary attack and had been followed up for one to six years, showed that nearly one-fourth were working full time, and a somewhat higher proportion were doing part-time or light work. The most serious deterrent to work is the fear of such patients regarding their condition. If this fear is overcome, they often do well; many are far better off being gainfully occupied.

31. How does the heart rest although it keeps beating?

The heart rests between beats. The interval is short—only a fraction of a second—but in the course of a day it adds up to a considerable length of time. If, however, the heart is burdened with an extra load, the period of rest naturally is lessened. This is why people with damaged hearts need adequate rest and should avoid prolonged physical exertion.

32. Should people with damaged hearts travel by air?

There is no definite evidence that ordinary air transportation has an adverse effect upon the heart, either healthy or impaired. Many people with heart trouble travel by plane yet death among flight passengers is very rare. The extensive experience of the United States Army Air Forces in evacuating sick and wounded during World War II likewise indicates that air travel presents no special hazards to patients. While flying, cardiacs should take the precautions of not exerting themselves unduly. What has been said here about air travel holds also for ground travel in areas of high altitude.

33. What are "blue babies" and what can be done to remedy their condition?

Before birth, the child does not use its own lungs but receives oxygen from the mother's blood through an opening in the membrane separating the right and left sides of the child's heart. At birth, when the baby's lungs begin to function, this opening in the membrane closes in the normal child. In a number of cases, however, this does not occur, with the result that normal functioning of the circulatory system is deranged. Specifically, the blood fails to get an adequate supply of oxygen and the skin then takes on a bluish tint. Until recent years there was no remedy. Now, however, surgical procedures are being used effectively to correct this condition.

34. What is cerebral hemorrhage and what are its causes?

Cerebral hemorrhage, more commonly known as "stroke" or apoplexy, is the rupture of blood vessels within the skull, resulting in a free flow of blood into the surrounding area. The consequent damage to the brain may result in paralysis or even sudden death. The causes of cerebral hemorrhage are not clearly understood. Quite frequently, the condition is associated with high blood pressure, arteriosclerosis, or other significant changes in the cardiovascular system. Deaths from cerebral hemorrhage are concentrated in the later ages of life, even more so than for heart disease.

35. What is the structure and function of the kidneys?

The kidneys are bean-shaped organs where the waste products gathered by the blood from the cells of the body are collected and eliminated. Each of the two kidneys is made up of more than one million tubules (nephrons) where the actual work of separating the waste products from the blood is performed. Within each nephron there is a knot of capillaries called glomeruli to which blood is brought by a very small artery. As the blood circulates through this knot, it gives off the plasma (the liquid portion of the blood) which is filtered into a tubule leading from the knot. In the course of the flow of the plasma through the tubule, there is returned to the blood most of the water and the normal ingredients. What is left contains body wastes and drains to the bladder, from which it is eliminated.

36. What is nephritis and what are its chief causes?

Nephritis, commonly known as Bright's disease in honor of the English physician who first described it in modern terms, is the most important and frequent type of kidney disease. In acute nephritis, which occurs during some infectious conditions, the kidneys are temporarily inflamed. This inflammation may interfere with the normal function of the kidney in eliminating body wastes from the blood, and if sufficiently severe may cause death or chronic disease of the kidneys. By far the most important type of chronic nephritis is that which results from the general physical breakdown of the kidneys, particularly the hardening of the arteries of the kidneys which is associated with the process of aging. This eventually causes elevation of the blood pressure and involvement of the heart and blood vessels.

37. What is the incidence of nephritis?

New cases of nephritis arise annually at the rate of 1.1 per 1,000 males and 1.3 per 1,000 females, according to the results of the *National Health Survey.* The rate rises very gradually with advance in age up through early adult life. Thus, at ages 30 to 39, it is about one per 1,000, and about twice that at ages 55 to 59. Thereafter the rate rises more rapidly to 3.4 per 1,000 at ages 65 to 69, and then to 5.5 at ages 75 to 79.

38. What are some of the common devices used to test the functioning of the circulatory system?

There are many specialized devices to test the functioning of the heart, kidneys, and blood vessels. The stethoscope, probably the most familiar of these instruments, is used by the doctor to hear the heart sounds more easily and to judge their quality. The sphygmomanometer is also well known; it is an instrument to measure both the systolic and the diastolic blood pressure. The electrocardiograph is a machine which traces graphically on paper the variations in electric current produced by the action of the heart. Physicians trained in this technique will recognize changes from the normal pattern which are indicative of heart damage. Then there is the fluoroscope, which permits the doctor to see an X-ray image of the heart and aorta in action. For a permanent record of the size and shape of the heart, the doctor takes pictures with the X-ray machine. In connection with the X-ray certain dyes are sometimes used to study the chambers of the heart, and the principal blood vessels of the chest and the lungs. Exercise and other tests have been devised to observe the functioning of the heart under strain. There are now routine procedures to study the chemical composition of the blood. Functional tests are also available to test the efficiency of the kidneys. Urinalyses are now routine, and are used to test for nephritis, diabetes, and other conditions. Among the kidney function tests are several so-called clearance tests, used to observe the efficiency of the kidneys. In addition to these more common devices to test for disturbances in the circulatory system, there are many others used, as occasion demands, for more accurate diagnosis.

39. What are some of the outstanding recent advances in the control of the circulatory conditions?

Notable progress has been made in the control of infections which leave their mark on the circulatory system. Rheumatic fever, which is the leading cause of heart disease up to about age 45, has recorded a considerable reduction both in incidence and in mortality. Similarly, syphilis, a major cause of heart disease in middle life, shows a declining death rate. Even for coronary disease, the prospects are becoming brighter in the light of recent developments, of which the use of anticoagulants is an example. The success of surgery with "blue babies" has been striking.[6] Surgery has also been successful in certain cases of high blood pressure. In recent years there has been renewed interest in special diets in hypertension. Of chief importance in this respect are the rice diet and diets that are low in sodium, a constituent of common table salt, and in a substance called cholesterol. For certain types of heart disease much has been accomplished with drug treatments. Among the newer drugs is penicillin, which is effective against subacute bacterial endocarditis, an infectious condition.

40. What efforts are being made to rehabilitate people with heart disease?

Rehabilitation programs for cardiacs are of recent origin. Several sheltered workshops for persons with physical disabilities accept a limited number of cardiacs. In New York and a few other cities, clinics have been set up to study the working capacity of cardiac patients and to advise them as to the type of work within their physical capacity. During World War II the War Manpower Commission and the United States Civil Service Commission analyzed the physical demands of various types of jobs to aid in the occupational placement of cardiacs as well as other physically handicapped persons. The Altro Workshop in New York City, which has been conducted for many years to restore ex-tuberculous patients to working capacity, has experimented with a similar program for cardiacs. Although this project has been carried on for only a relatively short time, the results indicate that the chief limitation in most cases is not so much the condition of the patient's heart as his attitude towards his disease. This applies to those who are able to work full time. For those with more severe limitations of cardiac capacity, there is need to work under sheltered conditions so that both the pace and the length of the working day can be accommodated to the individual.

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[6] See answer to Question 33 of this Chapter, page 186.

41. What is the National Heart Institute?

The National Heart Institute is one of the national institutes of health within the United States Public Health Service. The National Heart Institute was established in 1948 under an act of Congress which authorized it to support and conduct a program of research in the cardiovascular diseases and also to help the individual states in their local control programs. In accordance with this direction, the National Heart Institute granted ten million dollars in 1950 to research scientists and to institutions throughout the country for investigations into basic problems, for the construction of facilities and for the training of specialists. In addition, the institute carries on its own research projects in a number of federal and nonfederal institutions under various arrangements.

42. What is the American Heart Association?

The American Heart Association is a national voluntary health agency devoted to a program of basic research, community service, and health education in heart disease. Its activities are financed by funds solicited from the public. The association supports fundamental investigations conducted in medical schools and other institutions, helps to raise the standard of care of cardiac patients, and brings essential facts regarding heart disease to the public and the medical profession through lectures, discussions, publications, and other means.

43. What are the life insurance companies doing about the problem of the circulatory diseases?

Late in 1945, a large number of life insurance companies in the United States and Canada organized the Life Insurance Medical Research Fund for the purpose of supporting medical research on the diseases of major public health import. The fund operates by providing financial grants to institutions and fellowships to individuals engaged in important research projects. The fund has 146 life insurance companies as members and it distributed over three million dollars for research in the United States and Canada in the period from its organization to the middle of 1950. The results of these researches are published in medical and other professional journals. Most of the work being supported deals with high blood pressure, hardening of the arteries, heart disease, and rheumatic fever.

44. What can the community do to meet the problem of the circulatory diseases?

The local community can initiate case-finding campaigns among large sections of the population and can stimulate similar efforts in industrial groups. Cases of circulatory disease discovered in this way are likely to be in the early stages, when treatment can be most effective. The community can also see to it that adequate medical, hospital, clinical, and nursing facilities and personnel are available. At the same time, the public should be educated to make full use of available facilities. The community can also support a program of rehabilitation, including vocational training.

The keynote to community action is cooperation. By a pooling of knowledge and experience and by concerted effort, the official health agencies, the local medical and nursing societies, the voluntary health agencies, and civic groups can develop an integrated program.

45. What can the individual with circulatory disease do for himself?

Detection of the disease as early as possible is of paramount importance. This is best accomplished through an annual health checkup, but a physician should be consulted without delay for such symptoms as a pain in the chest, shortness of breath, and swelling of the feet or ankles. These symptoms, while they should be investigated, do not necessarily mean circulatory disease.

When a circulatory disease is discovered, the patient should follow the doctor's orders faithfully. In addition to taking medical treatment, the patient generally is required to live a life of moderation with respect to diet and general activity. Infections should be avoided, if possible, because they impose an added burden on the heart; when they occur, they should be treated without delay. By cooperating with his physician, the patient materially enhances his chances of survival.

XIII

THE PROBLEM OF THE RHEUMATIC DISEASES

1. What are the rheumatic diseases and why are they grouped together?

The term rheumatism covers a wide variety of diseases and disorders, namely, rheumatic fever, the various forms of joint diseases and some less clearly defined disorders such as muscular rheumatism, lower back pain, bursitis, neuritis, and sciatica. These conditions are classed together because they share certain symptoms and findings in common, particularly pain, stiffness, or swelling in the joints or muscles, and because a basic pathological relationship appears to exist between many of them.

2. How many people have rheumatism?

Rheumatism is the leading chronic disease in the United States as well as in many other countries. More than 7,000,000 persons in this country suffer from one of the many forms of the rheumatic diseases. Nearly 1,000,000 persons are disabled by these conditions for a week or more during the course of a year, and 150,000 are chronic invalids. As measured by the amount of time lost from work, rheumatism is second in rank among the causes of illness. This loss is now estimated to exceed 100,000,000 days per annum. Nevertheless, the rheumatic diseases, except for rheumatic fever, cause very few deaths.

3. What are the chief features distinguishing various conditions classified as rheumatism?

Age, type of onset, and the parts of the body affected help to differentiate the various rheumatic disorders. For example, rheumatic fever usually has its onset in childhood, and is often characterized by continued low grade fever and by muscle aches and joint pains which move from one set of joints to others. Its most serious aspect is the involvement of the heart. Rheumatoid arthritis usually has its onset between 20 and 50 years of age and is characterized by stiffness, pain, and swelling in the joints. Many joints are usually involved, but at first only one or two may be affected. Degenerative joint disease or osteoarthritis usually has its onset in middle and later life, and a certain few joints are primarily involved. Types of rheumatic diseases involving other structures than the joints are differentiated by the site and nature of the condition.

4. What is the relative prevalence of the various rheumatic diseases?

There are no accurate data on the prevalence of the individual rheumatic diseases. It has been estimated, however, that for those who seek medical care, the approximate proportions are

Rheumatoid arthritis	30 to 40 percent
Degenerative joint disease	25 to 30 percent
Muscular rheumatism, neuritis, sciatica, etc	10 to 20 percent
Traumatic arthritis	7 to 10 percent
Gout	3 to 5 percent
Rheumatic fever	3 to 5 percent
Miscellaneous forms	5 to 7 percent

Many sufferers from rheumatic conditions, particularly those not affecting the joints or those with degenerative types, do not seek medical attention, and consequently the true proportions are unknown.

5. What is rheumatic fever and what causes it?

Rheumatic fever is essentially a chronic disease marked, however, by one or more acute episodes. Occasionally it begins in the preschool ages, but it usually has its onset between the ages of five and ten, and less commonly after ten. The cause of the disease is unknown. Almost uniformly there is a history of a streptococcal infection, particularly sore throat, before the onset, but the nature of the relationship between this infection and rheumatic fever still remains obscure.

6. Why is rheumatic fever a serious condition?

The chief danger in rheumatic fever lies in the damage it often does to the heart. The disease is the principal cause of heart disease from childhood well on into middle life. The risk of permanent heart damage is increased by the recurrence of acute attacks, and it is for that reason that chief emphasis in the care of the disease is placed on the prevention of these recurrences.[1]

7. How does the prevalence of rheumatic fever and rheumatic heart disease vary with sex and age?

Rheumatic fever occurs somewhat more frequently among girls than boys. The rate of onset rises sharply from early childhood to a peak at around age seven; it declines slightly during the next few years to puberty, but then falls rapidly after the age of puberty. Chronic rheumatic heart disease has a prevalence rate of about three per 1,000 at ages under 20; 6.5 per 1,000 between 20 and 40; and eight per 1,000 between 40 and 50.

8. How does the prevalence of the disease vary by geographic area?

Rheumatic fever is world-wide in its prevalence. The disease, however, is most widely prevalent and most severe in the temperate zones and relatively infrequent and milder in the more tropical climates. Mortality and morbidity statistics show that in the United States the prevalence of the disease is highest in the Rocky Mountain and Middle Atlantic states and lowest in the area bordering the Gulf of Mexico and in the Southwest. The disease generally shows a higher concentration in urban industrial than in farming areas.

9. What is the effect of social and economic conditions on rheumatic fever?

Rheumatic fever occurs more frequently in low-income families than in those which are better off economically. Crowding in homes seems to be related to the incidence of the disease and appears to be more serious if living quarters are poor and unsanitary. However, even children from well-to-do homes are not immune to the disease so that poor environmental conditions may be considered as contributory rather than causative factors in the disease.

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[1] See answer to Question 3 of Chapter XII, page 175.

Household crowding is less frequent in rural than in urban areas and this in part explains the lesser prevalence of rheumatic fever in the former.

10. Is rheumatic fever a communicable disease?

No. It is true that multiple cases of rheumatic fever have been recorded within a short period of time in schools, military training camps and barracks, and even in families. However, these outbreaks have generally followed epidemics of streptococcal infections, especially streptococcal sore throat. The latter are contagious, not the rheumatic fever which develops in susceptible individuals in such epidemics.

11. Is the tendency to rheumatic fever inherited?

Careful analysis of family histories of patients indicates that the number of cases found is in line with what would be expected on the basis of the Mendelian theory of inheritance of a recessive characteristic. On this basis, both parents must either have had rheumatic fever or be "carriers" (i.e. able to transmit susceptibility to the disease to their offspring). If both parents had the disease, all the children will be susceptible; if only one parent has a positive history, the other being negative but a carrier, half the children will be susceptible. However, if neither parent had rheumatic fever, but both were carriers, one-fourth of the children will be susceptible. The incidence of the disease observed in twins also is consistent with the hypothesis that heredity plays a part in rheumatic fever. Among identical twins in rheumatic families, both are usually affected, if at all; but among fraternal twins, the occurrence of the disease follows the usual pattern.

12. How does rheumatic fever compare with other diseases as a cause of death among children?

At ages 5 to 14, rheumatic fever (including rheumatic heart disease) is, next to cancer, the leading cause of death from disease. Moreover, at these ages it causes more deaths than all the principal communicable diseases of childhood and poliomyelitis combined. At ages 15 to 19 rheumatic fever is the leading cause of death, and at 20 to 24 it is second only to tuberculosis.

13. What has been the trend in mortality from rheumatic fever?

The death rate from acute rheumatic fever and rheumatic heart disease has been declining steadily for a long time. Since 1920 the reduction at ages 5 to 24 years among Industrial policyholders of the Metropolitan Life Insurance Company amounted to 80 percent. In the last decade alone the rate has been cut by more than half. There is likewise evidence that the death rate from rheumatic heart disease has been declining at ages past 25.

14. Does the occurrence of rheumatic fever vary according to season?

Acute episodes of rheumatic fever are least frequent in the fall of the year. They show a steady rise during the winter and spring months to a peak in April or May and then recede gradually to the fall minimum.

15. What is the effect of rheumatic fever on the heart?

During an acute attack of rheumatic fever, there is often an inflammation of the muscle, valves, and lining of the heart. In some cases this virtually clears up with recovery, but frequently the heart is left permanently and more or less seriously damaged. Recurrent attacks of rheumatic fever increase the likelihood of serious heart impairment. This impairment generally is due to scarring of one or more of the valves, as a result of which the heart does not function properly. This may put an extra burden of work on the heart, and bring an increase in its size and premature breakdown. To some extent this may be averted or postponed if the individual keeps his activities within the working capacity of the heart.

16. Can rheumatic fever be prevented?

No specific measures are known which will forestall initial attacks of rheumatic fever, but recurrences can often be prevented. This depends primarily on maintenance of a high level of health, a good diet, sufficient rest, and avoidance of streptococcal infections, particularly of the respiratory tract. It is especially important for children who have had an attack of rheumatic fever to keep away from people with colds and sore throats and to dress properly in cold and inclement weather. The routine use of sulfa drugs and penicillin during the winter and spring months has been shown to cut the frequency of recurrences, but this should be done only under medical supervision.

17. What are the symptoms of rheumatic fever?

The early symptoms of rheumatic fever may be very mild and not at all specific of the disease. Among such symptoms are pallor, poor appetite, and failure to gain weight. More characteristic symptoms are frequent nosebleeds, pain in the joints or muscles of the arms and legs or in the abdomen, and a persistent low grade fever. Although the disease is called rheumatic fever, joint symptoms may be a minor feature or essentially absent. Chorea, or Saint Vitus' dance, may be a symptom leading to its discovery, especially in older children.

18. How is rheumatic fever treated?

Complete and prolonged bed rest is the basic element in the treatment of rheumatic fever. The aim is to lessen the work of the heart in order to avert damage to the organ or to minimize such damage. No specific measures are available to combat the infection itself, although the salicylate drugs such as aspirin are commonly used in treatment in order to reduce the fever and relieve the pains in the muscles, joints, and tendons. In some cases bed rest must be continued for many months. Regular medical supervision is necessary. Good nutrition is also important. Activity can be resumed gradually only on the doctor's advice. Today increased emphasis is put on measures to avoid making the child a chronic invalid. Consequently the child is encouraged to engage in simple games and hobbies which can be carried on in bed with little physical effort, and home instruction in his school work is recommended for school-age children during the period of convalescence.

At present adrenocorticotropic hormone (ACTH) and cortisone are being tried experimentally in treating the acute phases of rheumatic fever. These hormones appear effective, at least temporarily, in relieving symptoms and in suppressing cardiac damage. However, they have dangerous side effects and consequently authorities do not recommend their use except under rigidly controlled medical auspices. Current research on these drugs is being conducted on a large scale, and it is hoped that this will eventually yield new knowledge about the disease itself as well as new methods of treatment.

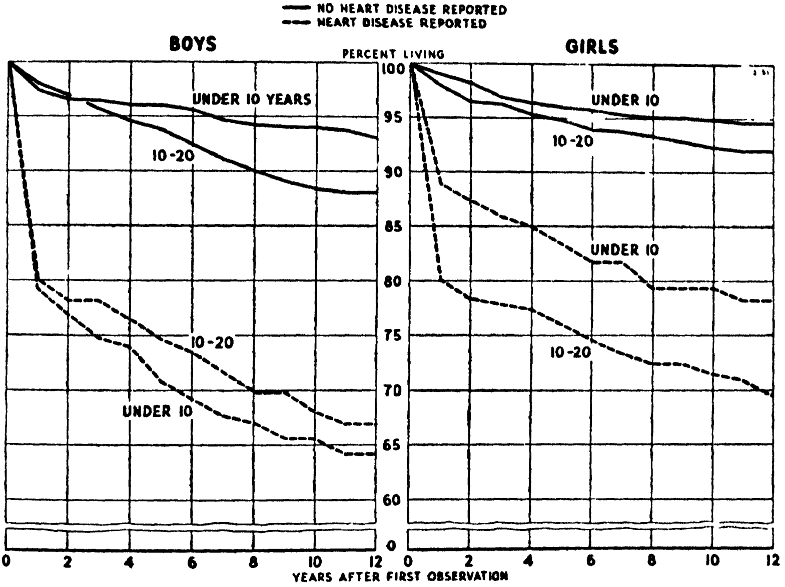

Chart 15. Survivorship of children with rheumatic fever. Industrial policyholders of the Metropolitan Life Insurance Company who received nursing care during 1936–1938, traced to anniversary of discharge from care in 1948. By sex, age, and cardiac status at first observation.

19. Does change of climate help victims of rheumatic fever?

Most rheumatic fever specialists now generally agree that a change of climate is neither desirable nor necessary in the care of the patient with rheumatic fever. While there may be less risk of streptococcal infections in areas with a warm, dry climate, these areas may not have adequate medical facilities for the care of the patient. Moreover, if the patient returns to his original environment, he is just as likely to have a recurrence of rheumatic fever. Consequently, potential gains from seeking a more favorable climate are usually outweighed by the economic and other problems resulting from breaking up a home and settling elsewhere. Good care and proper medical supervision are much more important than climate in controlling the disease.

20. What is the effect of rheumatic fever on longevity and working capacity?

This depends greatly on the extent of heart damage during the acute episodes of rheumatic fever. This is clearly evident from a follow-up study of nearly 3,000 children and young people made by the Metropolitan Life Insurance Company. Of those under age ten at first observation who had no reported evidence of heart damage during the attack, 94 percent were still living at the end of 12 years. For children between ten and 20 years, 90 percent survived. However, among those with evident heart disease at first observation, the proportion surviving at the end of the twelfth year was 71 percent for the younger children and 68 percent for the older children. Generally, the record was better for girls than boys. (See Chart 15 on page 199.)

The great majority of these young people now lead quite normal lives. Most of those who have reached adult life are working and many are married. Sizable numbers of the older boys were in military service in World War II. Many of them were in combat units, and five of them lost their lives in action.

21. Can women who have had rheumatic fever bear children safely?

Each case must be considered individually. Where no significant heart damage exists following rheumatic fever, the risk to the pregnant mother is much the same as in those who have not had the disease. There is little extra risk for women with mild rheumatic heart disease who can engage in the everyday activities of housekeeping, office work, or light factory work, without evidence of strain on the heart. Whatever added risk there is can be minimized by good medical care from the beginning of pregnancy. In the follow-up study by the Metropolitan Life Insurance Company of children with rheumatic fever,[2] it was learned that many of the girls became mothers, not a few having several children.

[2] See answer to Question 20 of this Chapter.

22. What public health measures are effective in controlling rheumatic fever?

Measures which lead to early detection of cases of rheumatic fever have been most effective. These comprise periodic examination of children in rheumatic families, school health examinations, follow-up of children who are under par or who have chronic infections, and careful observation of such cases by teachers in the public schools. These measures are also valuable in the early detection of recurrences.

Educational programs are also of value. These extend to various groups in the community: to physicians in order to help them improve their knowledge of the disease, and to parents and teachers so that they may bring children with signs and symptoms of the disease to medical attention. Education has also been important in creating a more hopeful attitude toward the outlook in rheumatic fever and rheumatic heart disease.

Because of the chronic nature of the disease and the cost of prolonged care, public provision of hospital, laboratory, and public nursing facilities are important. In addition, public-supported research of many types has yielded knowledge of value in the control of the disease. In the same general way, the many public health measures which have contributed to a high level of child health have raised the resistance of children to rheumatic fever and have indirectly contributed to its declining incidence and mortality.

23. What special facilities are needed in the control of rheumatic fever?

The special facilities useful in the control of rheumatic fever are child cardiac clinics and consultation services, separate hospital wards or hospitals, public health nursing, home instruction, and vocational training and guidance. The cardiac consultation services and clinics are often needed for diagnosis; the latter also provide supervision and follow-up of children with rheumatic heart disease. The special wards or hospitals are needed to furnish adequate care over long periods for the many children with rheumatic fever who cannot get this care at home. The children can get their schooling during their convalescence in these hospitals. The special hospitals provide invaluable opportunities for research in rheumatic fever. Public health nurses and visiting teachers serve the children receiving care at home.

In the Crippled Children's Program, which is operated in individual states with financial support of the federal government, a comprehensive service is provided for children with rheumatic fever. At present 25 states have developed such services, but only in a few are they on a state-wide basis.

The special facilities needed for rheumatic fever are scarcely adequate anywhere. This is particularly true regarding long-range needs such as rehabilitation and job placement of the patients.

24. How can the schools contribute to the control of rheumatic fever?

The schools occupy a unique and important position in relation to rheumatic fever control. The disease usually begins at the lower elementary school ages, and recurrences are most common while the children are still of elementary or high school age. Teachers and others in daily contact with school children can be taught the early signs and symptoms that may mean rheumatic fever, and the types of children among whom the disease is most likely to develop. This is useful in the early detection of recurrent as well as new cases. School nurses also can contribute to the early detection of cases and also to adequate follow-up in order to keep known cases under medical supervision. School health examinations may reveal unknown cases or changes in the cardiac condition of children who have had rheumatic fever.

25. What is rheumatoid arthritis and what causes it?

Rheumatoid arthritis is a chronic disease affecting chiefly the joints and adjacent muscles. It is not an infectious disease although in many cases it has the characteristics of an infection. Sometimes the inflammation of the joints resembles rheumatic fever. It is a systemic disease, i.e. not localized. In the late stages, rheumatoid arthritis is marked by deformity and immobility of the joints, with changes in joint and bone structure and atrophy of the adjacent muscles.

The cause of this disease is still unknown. There appears to be a hereditary factor. A high percentage of the cases report other members of the family to be affected. In view of the recent discovery of the response of the disease to adrenocorticotropic hormone (ACTH), it is now suspected that the condition may be of glandular origin.

26. What are the major features of the onset and course of rheumatoid arthritis?

The onset of this disease is usually insidious. It may be rather difficult to determine just when the disease begins because the early symptoms may not be specific. For example, these may be simple fatigue, muscular stiffness, loss of weight, and general debility. Among the factors which may precipitate symptoms are lowered physical resistance, exposure to damp and cold, chronic infections, emotional stress, and injuries. Usually the first joints affected are those of the fingers and then other joints in the wrists, arms, legs, feet, and spine gradually may become involved. There is characteristic swelling of certain joints. Pain occurs with movement of the affected parts and increases in severity as the disease progresses. The early course of the disease is marked by remissions and relapses.

If the disease progresses, both symptoms and changes in the affected joints become more marked. In the advanced cases, there may be severe crippling, consolidation (ankylosis) of some joints and contractures of affected limbs. These effects are sometimes so severe that the patient may become chair- or bed-ridden.

27. Why is the rheumatoid form of arthritis of particular importance as a cause of disability?

Rheumatoid arthritis holds first place among the chronic diseases as a cause of disability and crippling at the working ages. It is estimated that in 80 percent of the cases onset occurs between ages 20 and 50. The disease is also of major medical, economic, and social importance because of its severity and the prolonged disability and loss of working capacity resulting from it. About two to three times more women than men are affected by the disease; it also tends to occur at an earlier age among women.

28. How is rheumatoid arthritis treated?

There is no specific cure for rheumatoid arthritis at the present time although it is possible in many cases to control the disease or delay its progress. The measures of proved therapeutic value are for the most part directed toward improving the general health of the patient. Rest for the body as a whole and for the inflamed joints is probably the most important single measure in the treatment of acute phases of the disease. Great emphasis is placed on prevention of deformities of the joints by the use of splints, proper exercises, and physical therapy. In view of the frequency of emotional distress as a factor in the disease, psychotherapy is of value for many patients.

Few drugs have had any proved effect on the disease. Gold compounds have had an increasing vogue in recent years, but because they have potential toxic effects, they can be most safely prescribed only by physicians experienced in their use and familiar with the early signs of toxic reactions.

New promise of effective drug treatment of the disease is given by adrenocorticotropic hormone (ACTH) and cortisone, recently discovered hormones which have produced dramatic remissions of the disease. There are, however, serious drawbacks to their use. Now a combined treatment with ACTH and gold compounds is being tried.

The observation that remission of rheumatoid arthritis often occurs in pregnancy has also suggested the existence of an endocrine factor in this disease. In the past, various attempts have been made to treat the disease with various placental products or even by transfusions from pregnant women, but without any consistent benefit. Recent trials with plasma taken from mothers shortly after childbirth and with the hormone pregnenolone have shown promising results. The period in which this treatment has been tried is still too short to allow a proper evaluation of its effectiveness.

29. What is the prognosis in rheumatoid arthritis?

The outlook for persons with this disease is extremely variable and it is, therefore, difficult to predict what it will be for the individual patient. However, the widespread feeling of pessimism regarding its prognosis is far from justified. The disease is subject to remission and with good care the periods of remission can be greatly lengthened; at the same time, much can be done to give the patient relief. The experience of specialists in the field shows that about one-fourth recover completely, and that about one-half have periods of freedom of varying length. Up to recent years, the remainder of the cases, about one-fourth of the total, seemed to suffer progression of the condition no matter what was done for them. It is for these cases particularly that the recent discoveries of hormone treatment hold out the greatest hope.

30. What is osteoarthritis and what causes it?

Osteoarthritis, or degenerative joint disease, is a chronic disease characterized by degeneration and enlargement of cartilage and bone. Pain occurs generally upon use of the affected joints. Unlike rheumatoid arthritis it is usually localized, affecting chiefly the weight-bearing joints and those of the ends of the fingers. The disease is for the most part a consequence of wear and tear on the joints with advancing years, coupled with injuries to these structures.

31. How does the prevalence of osteoarthritis vary with sex and age?

This degenerative type of joint disease is the most common. Some evidence of the joint changes characteristic of this condition can be found in most persons over 30. However, clinical manifestations rarely occur until much later in life; they reach their peak of frequency in elderly people. There is no marked sex difference in the prevalence of the disease, particularly if allowance is made for the fact that at the ages at which it usually occurs women in the general population considerably outnumber men.

32. What are the chief characteristics of osteoarthritis?

In the very nature of the disease the onset is not clearly defined. Rather marked degrees of degenerative changes in the joints may be found on X-ray even though the individual has no complaint or discomfort. A frequent early sign of degenerative joint disease is a tingling sensation in the fingertips. Other symptoms which become more prominent with progression of the disease are stiffness and pain on motion. This is increased with activity. As time goes on, deformities in the affected areas occur. A characteristic deformity in advanced stages of the disease is the bony enlargement around the last joint of the fingers so frequently seen in older people. Generally they develop gradually, but occasionally rapidly.

The joints of the knee are a frequent site of degenerative changes.

These may occur relatively early because of excessive strain on these joints or injury to them. Obesity is also a factor in many cases. The joints in other areas may also be affected. The most severe cases are those involving the hip joints and the spine. The extent of crippling in osteoarthritis is sometimes very great, and, as in rheumatoid arthritis, may cause invalidism.

33. How is osteoarthritis treated?

This disorder cannot be cured, but the pain and discomfort it causes can be relieved to a very great extent and the degenerative process retarded. Resting the affected joints is perhaps the most important measure in treatment. Where necessary, further relief can be obtained by supporting the affected parts by orthopedic appliances such as splints, strapping, and braces, or in the spinal forms of the disease, by use of a corset. Where obesity is a causative factor, weight reduction is of value in cutting down the strain on the weight-bearing joints. Physical therapy such as heat and massage is valuable in treating the disease, and the salicylate drugs (aspirin, etc.) give some relief from pain.

34. What is gout and what causes it?

Gout in its classical form is perhaps the easiest to recognize of the diseases affecting the joints. It is a disease of metabolism—that is, of the process of breakdown of foods into forms utilizable by the body for energy and for maintenance and repair of the tissue. The abnormality in this disease is in the metabolism of protein, and more specifically of uric acid, an end product of its breakdown. As a result the concentration of uric acid in the body is raised. The mechanism by which this occurs is not yet established. Uric acid crystals are deposited in the joints and other tissues. This gives rise to the characteristic swellings (gouty tophi) of the toes, fingers, and wrists, and nodule-like deposits in or on the ears. Usually the disease is recognized by an acute attack which has a sudden onset with typical symptoms.[1]

The cause of the disease is unknown. Heredity is a distinctive factor. Overindulgence in food and alcohol has long been associated with the disease, and although the nature of the relationship is obscure, they are provocative factors in acute attacks. However, the disease occurs in total abstainers from alcohol.

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[1] See answer to Question 36 of this Chapter.

35. How prevalent is gout?

Gout is one of the less frequent of the diseases affecting the joints, at least in its clinically recognizable form. The number of cases in this country is estimated to be about 350,000. These are, with few exceptions, persons past 30, and the peak of the disease appears to be between 40 and 50. More than 90 percent of the victims of gout are men. So far as is known, no racial group is free from the disease, and cases occur in persons of every social-economic level

Gout has been known from ancient times. It is, however, much less prevalent today than ever before. Possibly the better diets of today act to prevent its clinical appearance in a substantial proportion of the cases. The disease appears to be less common in this country than in certain areas of Western and Southern Europe, but reliable statistics on its prevalence do not exist to back up this impression.

36. What are the chief features of the onset of gout?

The onset of gout is usually sudden and gives no warning symptoms, although some experts in the field assert that a symptomless phase is common before the acute phase which leads to the diagnosis of the disease. The rapid and acute onset of gout is often a good clue to the diagnosis. Typically, there is acute swelling of a single joint, which within the space of a few hours becomes hot, red, and very tender. The joints of one of the big toes is most commonly affected. Other frequent early sites are the leg, the ankle, the heel, and the knee. Any joint may be affected, but usually those of the lower extremities. The initial attack may last a few days, but sometimes as long as a fortnight. In the initial attack the symptoms usually clear up and complete restoration of normal function of the joints occurs.

37. What is the course and prognosis of gout?

The course of the disease is quite variable. A considerable length of time—sometimes many years—may elapse before a recurrence, and in fact further attacks may be warded off for even longer periods if the patient sticks faithfully to treatment. When the disease recurs the joints affected may not be the same as in the initial or previous attacks. Eventually the characteristic deposits of urate crystals occur. Usually this happens only ten years or more after the initial attack. From one-fifth to one-half of the chronic cases show these deposits, according to different reports. The deposits vary in size from a small fraction of an inch to as much as two or three inches. The ears are the most common site. If gout is inadequately treated and controlled, attacks occur with increasing frequency, there is less freedom from pain between attacks, and characteristic joint deformities develop. In some cases the high concentration of uric acid in the blood leads to the formation of kidney stones and eventually failure of the kidneys may occur. This is a major cause of death among persons with chronic gout.

38. How is gout treated?

During the acute attack, the patient is kept at complete rest and where possible the affected part is elevated. Because of the extreme tenderness of the part, even the weight of the bed clothes may cause discomfort and provision is made to protect it from contact or pressure. A simple diet with abundant liquids is prescribed in the acute attack. A drug called colchicine is now commonly used, but because it is relatively toxic, it can be used only under medical guidance.

Since the disease is essentially a chronic condition with periods of remission, treatment must be on a long-range basis and attention given to the correction or management of complications and deformities. Diet plays a primary role in the long-term plan of treatment. This diet is low in those foods which are considered to cause excessive uric acid in the blood. These are meats, fish, seafood, and the leguminous vegetables—beans, peas, and lentils. Certain foods, such as liver, kidneys, anchovies, and sardines, as well as alcoholic beverages, are entirely forbidden. The main content of the diet includes eggs, vegetables, milk, cheese, and fruits. The patient may also have to use the drug colchicine for extended periods. For victims of gout who are overweight, a weight reduction diet is usually beneficial.

39. What are the major types of nonarticular rheumatism and how prevalent are they?

These types of rheumatism cover a variety of disorders, most of them related, and involve many body structures. Heading the list in importance are those forms which are now grouped under the heading of fibrositis. These include muscular rheumatism, bursitis, lumbago, involvement of the joint capsules, and the areas around the large nerves such as the sciatic nerve. Fibrositis in its various forms is the most common of all the rheumatic diseases, and in the medical experience of the British army accounted for the majority of admissions to hospitals for rheumatism. Fibrositis may occur as a primary or a secondary disorder. It is frequently associated with infections, with the articular forms of rheumatism, and with postural and structural defects. It is highly important as an occupational disorder, either as a result of injury or physical strain involved in the job. It is frequently brought on by exposure to cold, sudden changes in temperature, or fatigue.

The symptoms of fibrositis are pain, stiffness, or soreness of the involved structures. Specific physical changes are negligible. In a high proportion of cases, emotional stress is an important factor in causing the disease. Some physicians, in fact, consider fibrositis one of the most common of the psychosomatic disorders.

Fibrositis is distinguished from rheumatoid arthritis largely by the absence of such symptoms as joint pain and swelling, muscular atrophy, weight loss, and bone changes. Characteristic of fibrositis are a normal temperature and prompt response to treatment.

Often included with the rheumatic disorders are many conditions such as neuritis and back and foot pains which are essentially of an orthopedic character but in which there are secondary rheumatic manifestations.

40. What is the treatment and prognosis in nonarticular rheumatism?

The treatment of muscular rheumatism and fibrositis is relatively simple. In the acute stage, protection from cold and relief from pain are most important. Aspirin and similar drugs generally suffice to relieve pain, but where indicated, injections of suitable local anesthetics are used. In low back pain and sciatica the patient should rest flat on his back and the mattress should be firm or boards placed under it.

When the acute attack of fibrositis subsides, physical therapy of various kinds is useful. These include heat, massage, mild exercise, hot baths, and sometimes diathermy. In many cases it is necessary to teach the patients to correct their bad postural habits and to take off excessive weight.

In cases where rheumatic conditions are secondary to other disorders, the patient obviously needs careful examination to determine the underlying cause, if unknown, and suitable treatment for the primary disorder.

The outlook in uncomplicated nonarticular rheumatism is excellent if the patient fully cooperates in treatment. Symptoms may be quickly relieved. However, emotional disturbances and long-established defects in posture and living habits are likely to prolong disability or lead to recurrences. Even in such cases, uncomplicated disorders of this character are seldom if ever fatal and are without any effect on longevity.

41. What organized attack is there against the rheumatic diseases?

The American Rheumatism Association, consisting of physicians interested in the disease, has carried on a limited program of professional education. It has made available to physicians summaries of the enormous literature on rheumatic diseases, and has organized national and international conferences on the subject. The few local societies of the association and individual members have encouraged local communities to provide better facilities, especially clinics, for victims of rheumatic diseases. The association sponsors the recently established Arthritis and Rheumatism Foundation to raise funds for a program of public education in these diseases and for support of research under the guidance of the association and a new Committee on Rheumatic Diseases of the National Research Council.

Organized activity by voluntary lay agencies against rheumatic fever has developed as an integral part of the campaign against heart disease under the auspices of the American Heart Association and local heart societies. To implement its rheumatic fever program, this association has formed the American Council on Rheumatic Fever which is composed of delegates from the American Academy of Pediatrics and other medical and allied professional groups. The council carries on a program of popular and professional education on the disease, stimulates improved treatment and increased facilities for its victims, helps community organization against the disease, and sponsors and finances research. The Life Insurance Medical Research Fund, the

Helen Hay Whitney Foundation and the Masons in New York State are also giving generous support to fundamental research in rheumatic fever.

The activities of official agencies include the new National Institute of Arthritis and Metabolic Diseases of the Public Health Service, which will expedite research in rheumatic diseases and provision of better local facilities for the diagnosis and care of these conditions. For many years now, a joint federal-state program has been in operation on behalf of children with rheumatic fever [2] and the funds and facilities of the National Heart Institute support research in the disease.

42. What needs exist in the field of the rheumatic diseases? [2]

In view of the widespread prevalence of these diseases and the comparative neglect of the field, the needs are great and varied. First, there is room for great expansion of hospital and clinic facilities. Special rheumatic clinics exist in a few cities, but even there they are inadequate in number and equipment. More beds are required for hospital care of cases and for clinical studies in these diseases. A few special hospitals for those with crippling disease would be of value. These institutions could combine care and treatment with rehabilitation and vocational training when necessary.

There is need for fundamental research in various phases of the rheumatic diseases. Up to now the amount of money available has been quite meagre. Fortunately, through the new Arthritis and Rheumatism Foundation and the new National Institute of Arthritis and Metabolic Diseases, research funds in this field will be greatly increased.

Another important need is a thoroughgoing program of professional education in diagnosis and treatment of these conditions. This would bring to general practitioners, who treat most of these cases, the latest knowledge about these diseases and their management.

[2] See Question 23 of this Chapter, page 201.

XIV

THE HAZARDS OF INFANCY AND CHILDHOOD

1. How many infants are there in the United States?

At the beginning of 1951 there were about 3,600,000 infants, that is, children less than one year old. They comprise 2.4 percent of our population—a small but very important section. Not only do they appeal naturally to our emotions, but they also attract our attention and interest because they are the start of a new generation.

2. Is infancy a healthy period?

Infants can take a surprising amount of hardship and still survive, much more than their helplessness and small size indicate. Nevertheless, there are great dangers to health in the first year of life. Disease and defect cause proportionately more deaths in the year of infancy than in any other year before advanced old age.

3. What is the infant mortality rate in the United States?

The infant mortality rate is usually expressed as the ratio of the deaths under one year of age during a stated period, as one calendar year, to the number of live births within that period; this ratio is generally multiplied by 1,000. Thus, the infant mortality rate in the country today is less than 30 per 1,000 live births, or under 3 percent. This is under half of what it was 20 years ago.

4. How does infant mortality in the United States compare with that in other countries?

The infant mortality record for the United States is among the best in the world. Lower rates are found in only a few countries, New Zealand, Sweden, Australia, and The Netherlands. Infant mortality is a good index of the general level of health in a country and also of the state of public health work. Infant mortality is generally highest in Asia and Latin America. For example, Chile in 1949 had an infant mortality rate of 169 per 1,000 live births.

5. What has been the trend in infant mortality since 1915?

In 1915, when the annual collection of birth statistics from registration records was started by the Bureau of the Census, only the New England states, New York, Pennsylvania, Michigan, Minnesota, and the District of Columbia reported. The infant mortality for these states as a whole was then 100 deaths per 1,000 live births. This was probably lower than the rate for the entire country.

By 1930, when all but South Dakota and Texas had joined the birth registration area, the rate had been cut to 65 per 1,000 live births. The infant mortality rate for 1950, covering the whole country, was only 29 per 1,000; this is the lowest so far.

6. How many lives have been saved by the reduction in infant mortality in the decade since 1940?

In 1950 alone, there would have been 70,000 more deaths of children under one year of age if the infant mortality of 1940 had continued unchanged. In all, the steady improvement in infant health since 1940 has resulted in saving the lives of 425,000 babies during the decade following.

7. Which regions within the United States have high and which have low infant mortality rates?

The rates are lowest on the Pacific Coast, in the Middle West and the Northeast. The rates are appreciably higher in the South and Southwest, even when comparison is limited to whites alone. The Mountain states have the least favorable record of all, the rates there averaging about 50 percent above those on the Pacific Coast.

8. Which season is safest for newborn babies?

Summer is the safest season for babies. In the warm months infant mortality is low—the rate for June, 1949, was 15 percent below the January figure. The principal communicable diseases of childhood and the acute respiratory infections are less prevalent then. Because the environment seems to be more favorable in summer, it is also a good time for babies to be born. If they have the summer months to gain strength, they are better able to resist the annual winter bouts with contagion.

9. What changes have taken place in the seasonal fluctuations of infant mortality?

At the turn of the century, summer was by far the most hazardous time of year for babies, with a mortality rate twice as high as in winter. Diarrhea and enteritis were then the chief fatal diseases of infancy, caused largely by unclean and improper food and contaminated milk and water. By about 1925, the standards of sanitation had improved and the respiratory diseases had replaced diarrhea and enteritis as the principal cause of illness in infancy, thus reversing the seasonal pattern. Summer then became the safest season, and it has remained so ever since. However, with the advances in health and medicine, the extent of the seasonal fluctuation in infant mortality has steadily been reduced.

10. To what extent are infant deaths concentrated in the very first days of life?

Mortality in the first year of life is highest at the very beginning and decreases steadily as the year advances. In 1948, for example, there were 10.7 infant deaths per 1,000 live births on the first day of life. In fact, if the death rate of the first day had continued for 100 days, not a single baby would have survived. One-third of infant deaths falls within the first day of life and well over two-thirds within the first month. The concentration of infant deaths in the early period has resulted largely from the reduction in the toll of the infections, thus increasing the relative importance of prematurity, birth injuries, and congenital difficulties.

11. What are the chief causes of death in the first month of life?

Nearly half of all deaths within the first month of life are caused by prematurity. Injury at birth accounts for almost one-sixth of these deaths and congenital malformations for more than one-eighth. Asphyxia, pneumonia and influenza, and diarrhea and enteritis combined make up about one-ninth of the total.[1]

12. What are the chief causes of death in infancy after the first month of life?

Pneumonia and influenza are the leading causes of infant death after the first month, accounting for well over one-quarter of the total. Congenital malformations rank second, with almost one-sixth of the deaths. Diarrhea and enteritis come third, also with almost one-sixth, and accidents fourth with one-twelfth.[1]

13. Are there differences in infant mortality according to race and sex?

In 1948, the infant mortality rate for Negroes was 46 per 1,000 live births, or one and one-half times that for whites. For other races (American Indians, Chinese, and Japanese) the rate was over twice that for white infants. The mortality rate in infancy for male babies is more than 25 percent above the rate for female babies.

14. What are the most frequent types of fatal congenital malformations?

The most common of all fatal congenital malformations are those of the heart, followed by those of the digestive system. Also not infrequently fatal are congenital hydrocephalus, and spinal and central nervous system defects. Although most deaths caused by congenital malformations occur very early, occasionally an individual with a serious congenital defect will survive infancy and die from a malformation sometimes even as late as in old age.

15. Does weight at birth affect the baby's chances of survival?

A baby's chances of successfully passing through the hazardous first month of life are greatly influenced by its weight at birth. The mortality rate is exceedingly high for the smallest babies but it drops sharply with increase in birth weight up to about five and one-half pounds.

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[1] See answers to Questions 11 and 19 of Chapter XVI, pages 246 and 248.

16. What is the outlook for further improvement in infant mortality?

The steady reductions in infant mortality in recent years can be expected to continue into the future. Not only is the practice of having births in hospitals being extended, but prenatal and postnatal care is also spreading. Public health facilities are being expanded in small towns and rural areas, where the birth rate and the infant mortality rate have been highest.

In the last half century, the advances have been made largely against the infectious diseases which caused infant deaths. Today, however, prematurity and malformation are the principal problems. Research on the effect of the nutrition of the mother and other aspects of maternal health, including the Rh blood factor on the constitution of babies, should help reduce infant deaths from non-disease causes. Altogether, it is not extravagant to expect that the infant mortality rate in our country will be brought down from slightly under 30 to about 20 per 1,000 live births during the next decade.

17. How many children are there in the United States?

In 1950, there were all told more than 47 million children in the United States, counting all under 18 years old. Normally, for health purposes, only those through the age of 14 are considered children: the others, in their late teens, are usually either considered separately or with young adults.

There are nearly 13 million children more than a year old but less than five; over 13 million between five and ten; and somewhat less than 11½ million aged 10 to 14. The combined groups, aged from one to 14, inclusive, number more than 37 million, or close to one-quarter of the entire population of the country.

18. What has been the trend in childhood mortality in the last half century?

The reduction in mortality among children since 1900 has been spectacular. In fact, a good part of the total reduction in the national death rate has resulted from the gains made among children. From

1900 to 1948, the death rate for the population at all ages was reduced by more than 40 percent. However, at ages 1 to 4, it was cut by more than 90 percent, and at ages 5 to 14 by more than 80 percent. At the turn of the century deaths in childhood (not counting infancy) comprised almost one-seventh of the annual deaths in the country; but in 1948, childhood deaths accounted for only about one-fortieth of the total.

The remarkable record of improvement in child health has been the result of a threefold advance: in sanitation, in medicine and in the standard of living in American families.

19. How many children are saved annually by the reduction in mortality since 1900?

Today, for every school child who dies, six would have died if the conditions of 1900 had continued to the present. For every preschool child who dies, 12 would have died but for the improvement since 1900. This comes to an annual saving of the lives of more than 200,000 children.

20. What are the safest years of life?

The chances of surviving from one year to the next are greatest at ages 9, 10, and 11. These are the safest years of life in terms of mortality. After infancy, the death rate drops to a low around the end of the first decade of life and then increases gradually to the end of childhood. After age 14, the rate continues up slowly until midlife when it begins rising more steeply. In old age, the increase in mortality with each year of life is extremely rapid.

21. What are the leading causes of death among children today, and how do they compare with years ago?

Currently, accidents account for over one-third of all white male deaths at ages one to 14 years, and for about one-quarter of all such white female deaths. Pneumonia and influenza, with about one-tenth of all deaths at these ages ranks second, and is followed closely by cancer. In contrast to this present-day picture, in 1910, when death rates in childhood were much higher, one-sixth of the deaths were from pneumonia and influenza, one-seventh from diarrhea and enteritis, and one-ninth from diphtheria. About one-twelfth of all childhood deaths were then from tuberculosis. In this early mortality picture, which was heavily weighted with infectious disease, only one-tenth of all deaths among white males at ages one to 14 years were from accidents.[2]

22. What are the principal communicable diseases of childhood?

The principal communicable diseases of childhood are diphtheria, measles, scarlet fever, and whooping cough. Over a generation ago, in 1910, these infections together accounted for one-quarter of all childhood deaths. Today, they are no longer the serious threats to survival that they once were. In 1948, they accounted for only about one-twenty-fifth of all deaths at ages one to 14.

23. How many children are killed in accidents?

Nearly 5,000 children aged one to four die every year from accidents of all kinds, and about 6,000 between the ages of five and 14.

24. What are the most frequent types of fatal accidents in childhood?

Motor vehicle accidents are the most frequent type of fatal accident in childhood. Burns, fires, and explosions also take a large toll, especially among girls; drownings are also an important factor, especially among boys. Serious falls are all too frequent among boys and girls, and firearm accidents are not uncommon among school-age boys. Railroads take the lives of numerous school-age boys, as the tracks and yards are favorite places to congregate and play.

In general, boys are more often involved in outdoor accidents than girls, but a great many fatal accidents to boys as well as girls occur in or around their homes. An appreciable number of small children are run over in their own yards and driveways.[3]

25. How do the diseases of childhood differ from those of the other periods of life?

The leading diseases of childhood, with the exception of cancer, are infectious diseases, and most of them are acute rather than chronic. They come on quickly, often cause extremely high fevers, and usually are relatively short-lasting. In contrast, the major health problems of adult life are more and more becoming the chronic and degenerative diseases with gradual and uncertain onset, long course, and too often a fatal termination. Against many of the childhood diseases, either immunization or drug therapy can be used; against the chronic and degenerative diseases of later life, prevention appears at present to be the most effective weapon.

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[2] See answer to Question 11 of Chapter XVI, page 246.

[3] See also Chapter XVI

26. How frequent is illness in childhood?

Under age 15, disabling illness is more frequent than at any other time of life except old age. According to one survey, in the course of a year over one-fifth of the children under 15 came down with some disabling illness lasting a week or longer, compared with about one-eighth of the adolescents (ages 15 to 24), one-seventh of adults (ages 25 to 64), and more than one-quarter of the aged (65 and over). The duration of illness in childhood, however, is relatively short. Counting only illnesses of at least one week duration, it averaged 27 days annually per illness under age 15, compared with 69 days for those 25 to 64, and 131 days for those 65 and over.

27. What are the causes of most school absences?

Recently the state of California investigated the matter of school absences and found that absences averaged about two and a half days each. The number of absences came to about 30 per 1,000 pupil-days, and the days lost from school to 76 per 1,000 pupil-days.

Four-fifths of the absences were medical in their nature. In many of the others, the child's help was needed at home, or the family took a trip, or parental neglect was involved. Truancy was the cause of only about one out of every 75 absences.

Among the medical causes for absence, the acute respiratory diseases were by far the most common, accounting for more than half. The common cold was around four times as frequent as all the other acute respiratory diseases put together. Digestive conditions, which were generally of short duration, accounted for about one-eighth of the absences for medical reasons. The common communicable diseases, including whooping cough, chicken pox, and mumps, caused relatively few absences, but these resulted in about nine days lost of school per absence. Headaches, muscle and joint aches, and other general complaints were generally of rather short duration.[4]

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[4] See answer to Question 16 of Chapter XIX, page 297.

28. How much has childhood mortality from tuberculosis been improved?

Tuberculosis was one of the most common causes of death in childhood at the turn of the century. Children in families having other tuberculous members usually contracted the disease very easily and succumbed quickly, most often to miliary or generalized tuberculosis infections. From 1900 to 1948 the tuberculosis death rate per 100,000 among children aged 1 to 4 was cut from 102 to seven, and among those aged 5 to 14 from 36 to 2. Although tuberculosis is still a leading cause of death in childhood among the colored, it is no longer among the important causes of early death for the white population of the country.

29. How successful has the campaign against diphtheria been?

The campaign has been a highly successful one because ways of controlling the infection and immunization procedures were discovered early and were quickly put into use through widespread public health efforts. In the period 1911 to 1950, the death rates at ages one to 14 among children insured with the Industrial Department of the Metropolitan Life Insurance Company dropped about 99 percent. Shortly before World War I, immunization of school children in large cities was begun, and by about 1934 the program had spread so widely that in New York City, for example, about half of the preschool children had been immunized. In 1947, 40 large American cities reported no diphtheria deaths at all, and in 15 of these cities, there had been none for at least five years.

30. What has been accomplished against measles?

The childhood death rate from measles has also been cut spectacularly. Among Industrial policyholders of the Metropolitan Life Insurance Company, mortality from this disease at ages one to 14 has been reduced by about 95 percent in less than four decades and has averaged only 1.2 per 100,000 for the years 1946–50. This decrease in mortality is difficult to explain because until recently there was no specific method of preventing or treating measles. Now, however, there is a safe and sure way of providing passive immunity. Gamma globulin, a product of wartime blood research, has been utilized for this purpose with striking success among infants. It has been used among older children to modify the severity of measles attacks and also to allow a mild case to provide lasting protection.

31. What progress has been made against whooping cough?

Whooping cough mortality has long been declining, and in recent years has been cut about as sharply as that from diphtheria and measles. Whooping cough is particularly hazardous to infants. In fact, the death rate from whooping cough in the first year of life is greater than for measles, scarlet fever, and diphtheria combined. The total reduction among children aged one to 14 insured with the Industrial Department of the Metropolitan Life Insurance Company was about 95 percent in less than 40 years. Much of the credit for this drop goes to immunization, especially in infancy, but a great deal is also the result of better infant care.

32. What gains have been made against scarlet fever?

The reduction in mortality from scarlet fever has been greater than for any of the three other principal communicable diseases of childhood. Formerly responsible for thousands of childhood deaths each year, scarlet fever is now reported as the cause of death of fewer than 70 children annually over the whole country. The death rate among children aged one to 14 insured with the Industrial Department of the Metropolitan Life Insurance Company has actually dropped more than 99 percent since 1911. The relatively recent introduction of sulfa drugs and penicillin therapy for streptococcus infections helped to speed the decline in scarlet fever mortality.

33. What has been the trend in acute poliomyelitis?

Although the death rate of polio has been declining over the years, there have been, nevertheless, frequent setbacks. The year-to-year fluctuations have been sharp, but the trend has been gradually downward. Though 1948 and 1949 were both epidemic years, they were not nearly so bad, as far as mortality is concerned, as 1916, when this country experienced its worst epidemic. In 1949, more than 42,000 cases of acute polio were recorded throughout the nation; this was a record for incidence. The death rate that year among children aged one to 14 insured in the Industrial Department of the Metropolitan

Life Insurance Company was 3.4 per 100,000, only about half the figure for the 1931 epidemic and less than a tenth of that for the outbreak of 1916.

34. How important is cancer in childhood?

Cancer, including leukemia and Hodgkin's disease, is now the second-ranking natural cause of death at ages one to 14, according to data for children insured with the Metropolitan Life Insurance Company. More than 2,500 children now die from these conditions each year in the general population of the United States. In 1943–47 the rate was about ten deaths per 100,000 insured children at ages 1 to 4 years; it was seven at ages 5 to 9, and about 5.5 at ages 10 to 14. The long-term increase in cancer deaths among children reflects in large part more accurate diagnosis, rather than a true increase in the incidence of the disease.[5]

35. Are rheumatic fever and heart disease childhood illnesses? [6]

36. At what rate do children become diabetic? [7]

37. What are the common causes of physical handicaps in childhood?

It has been estimated that about 400,000 persons less than 21 years old are listed in the state registers of crippled children, and that a great many additional children are partially or totally crippled but not registered.

The leading cause of physical handicaps at the younger ages is poliomyelitis, accounting for one-fifth of the cases. Second is cerebral palsy, a condition which until recently has received little public attention, although it is not uncommon and those suffering from it can be greatly helped by proper care.[8] Injuries also cause a number of orthopedic impairments. Clubfoot is not too infrequent as an impairment. Rickets, once a common complaint and the cause for much crippling, is now relatively rare because of improvements in knowledge about nutrition and advances in the standard of living. (See Chart 16.)

[5] See also Chapter IX, page 129.

[6] See Chapters XII, page 174, and XIII, page 193.

[7] See answer to Question 13 of Chapter X, page 147.

[8] See answer to Question 46 of Chapter XXI, page 346.

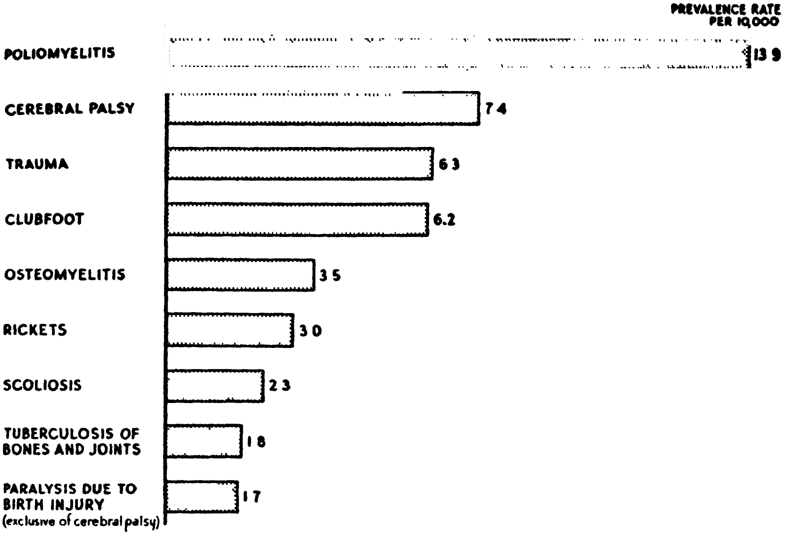

Chart 16. Leading causes of orthopedic impairments among children under age 21, United States January 1 1945

38. What proportion of school children have health defects of any kind?

In Philadelphia, where about 100,000 medical examinations are given each year to public school children, 80 percent were found to have some physical defect. Aside from tooth, sight, and hearing difficulties, which might normally be expected to occur rather frequently, there were a large number of other defects. Twenty percent of the children were not at their proper weight, with the underweights greatly outnumbering the overweights. Poor posture, flat feet, and curvature of the spine were found in 17 percent of the children. Nearly 13 percent had diseased tonsils. About 6 percent had nasal obstructions.[9]

39. How common are sight, hearing, and speech defects among school children?

In the Philadelphia studies, about one out of every nine children was found to have defective vision in one or both eyes, but in earlier surveys of 30,000 school children in a number of cities, one out of every three school children was found to have impaired sight. Hearing difficulties are much less common. In the regular physical examinations in Philadelphia, only about one-hundredth of the children were found to have hearing problems, but a special study of the fourth and fifth grades with audiometer tests more than tripled the proportion. Speech problems were found in about one out of every hundred school children.

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[9] See answer to Question 16 of Chapter XIX, page 297

40. Do most school children have a complete set of healthy teeth?

The condition of the teeth of our school children is definitely unsatisfactory even in high-income families. More than 95 percent of the children reaching the age of 15 have already experienced some decay in their permanent teeth. Moreover, these defects are not receiving the required attention. It has been estimated that the necessary dental work was being done at only about one-sixth the rate at which the defects occurred.

41. Has the stature of school children increased in the last generation or two?

Both boys and girls are now at least a couple of inches taller than they were at the end of the last century. This was observed in a study of children 6 to 14 years old in Toronto for the period from 1892 to 1939. As might be expected, today's taller children also weigh more.

42. What are the voluntary organizations in the field of child health and welfare?

The only voluntary organization whose specific interest is general child health is the American Academy of Pediatrics, a professional medical society. Among the existing lay organizations are the National Society for Crippled Children; the National Foundation for Infantile Paralysis; the Child Welfare League of America, which emphasizes the institutional aspects of child care; the Family Welfare Association of America; and the National Child Welfare Division of the American Legion. The American School Health Association is the professional society of school doctors, nurses, and hygienists.

The voluntary lay organizations have been actively stressing the educational and emotional problems of childhood. The National Congress of Parents and Teachers has been prominent in the first area, and Child Study Association of America in the second. The latter publishes many books and pamphlets on child problems, and organizes counseling services, lectures, and study groups. Within communities there are, of course, dozens of local organizations whose primary concern is the welfare of children.

43. What are the government agencies in the field of child health and welfare?

The federal, state, and local governments have agencies concerned with child health and welfare. Our Social Security Act provides a program for aid to dependent children and also for money grants through the Children's Bureau to states for the improvement of their child health plans. The Children's Bureau studies child health and welfare, publishes reports, and suggests standards for child care. There are, in addition, the school lunch program and the various services of the United States Office of Education and the Public Health Service. In December 1950, the fifth White House Conference on Children and Youth provided the occasion for a large gathering of those interested in child health and welfare to discuss various problems and to make recommendations for bettering the life of children.

Every state has a department of welfare, health, and education, and most of these have special divisions devoted to children. Local city and town governments have a great variety of institutions dealing directly with children. The responsibility of the public for the health and well-being of children has become well established in law, even to the point where the state can take children away from their parents if it is thought necessary.

44. What can schools do to improve the health of school children?

The nutrition, dental care, mental health, sight, and hearing of children require more attention. In this regard, teachers are in a particularly good position because of their close daily contact with children. Coordination between doctors, nurses, and teachers, and careful physical and dental examinations in schools can catch many health deficiencies before they develop too far. Teaching programs among the children can also promote a sense of responsibility for their own health and encourage good health habits.

XV

OUR OLD PEOPLE

1. Who are our old people?

The old are usually considered to be those who have reached or passed the age of 65. This is arbitrary. The changes in people's lives are continuous and progressive. No one wakes up on his sixty-fifth birthday to find himself completely different in mental and physical health from the day before, and no two people age in precisely the same way. Many are still fully capable of vigorous mental and physical activity until well into their seventies or eighties. Some show signs of aging and deterioration while still in their fifties. It is for convenience and for statistical purposes that the period from 65 to the end of life is called old age. Too often it is a difficult period, but it can be an active time with a quality all its own.

2. What is meant by "aging"?

In general, aging is change. It begins with life itself and is arrested only by death. In a more limited sense, aging may be considered as the physical and mental changes that take place in the years past the prime of life. There are a number of familiar signs of the aging process—the thinning and graying of the hair, and the drying and wrinkling of the skin. As people grow older, their vision and hearing decrease in acuity. At the same time, the functional efficiency of the body becomes diminished. The thickening and hardening of the arteries impede the circulation of blood and diminish nutrition to the vital organs. The heart, the blood vessels and the kidneys gradually lose their elasticity and their ability to adapt themselves to the changing needs of the body. The digestive track and other systems of the body likewise show increasing degenerative changes.

The way in which any individual grows old is determined by the constitution he inherited and the accumulated experience he has had, including what Dr. Stieglitz calls the "innumerable chemical, psychologic, and physical insults to which we are all subjected." Aging undoubtedly brings a blunting of many human faculties, but it is not necessarily a process of decline. Many of the decreased abilities are counterbalanced by gains in other fields. A loss in memory for detail, for example, may be accompanied by an improved ability to see the relationships between ideas. Aging is unavoidable, but instead of being feared, it may even be enjoyed.

3. How many old persons are there in the United States and what proportion of the population do they constitute?

At the half century mark—in 1950—there were about twelve and one-third million persons in the United States who were 65 years old or more. They made up 8 percent of the total population. Of the old, more than five million were between 65 and 69 years of age; about three and one-half million between 70 and 74; and the remainder, more than 3¾ million, were 75 or over.

4. Do we have proportionately more of the old than most countries?

The answer is yes. It is partly the proud result of the high standards of living and of health in the United States. The countries of Western Europe and the nations of the British Commonwealth also have fairly high proportions of their populations in the older age groups, while the opposite is the case in most of Asia, Africa, and South America. In parts of Europe, where the population has been growing very slowly, if at all (France is a good example), the proportion of aged is even higher than in the United States.

5. In what sections of the country do most old persons live?

There are striking differences in the concentration of old persons in different sections of the country. The old form the highest proportion of the total population in such long-settled New England states as Maine, New Hampshire, and Vermont, where almost one out of every ten persons is now at least 65. The lowest proportion is found in North and South Carolina and New Mexico. Southern California and Florida, partly because of their climate, have become favorites with the old and retired. In some places they have colonies almost exclusively composed of persons in their sixties, seventies, and eighties. In general, however, the South has relatively fewer elderly persons than any other part of the country. Small towns are popular with the aged, possibly because living costs there are comparatively low and because they provide the quiet atmosphere older persons need. On the whole, rural farm areas have the smallest proportion of the old, with a higher proportion in the cities and urban areas.

6. Is the proportion of old persons growing?

The aging of the population has been accelerated in the last few decades. The number of old people doubled in the last quarter century and is now increasing by about 300,000 a year. In 1900, those 65 years old and over constituted only about 4 percent of the population. By 1950, the figure was over 8 percent.

7. What are the political and social implications of this progressive aging of our population?

The cost of providing for the retired, the chronically ill, or the just plain old will be an increasing burden for the country to bear as the proportion of old persons rises. The gap between what is done and what ought to be done will provide an obvious appeal for politicians and political parties. Schemes like the Townsend Plan and the late Huey Long's Every-Man-a-King program are likely to become more numerous and more popular. The more old there are, the more old voters there are to back up these plans and to change the whole political outlook of the nation. The immediacy of this danger can be seen in the experience of California and some other states where the old have already made themselves a leading political force by organizing according to age instead of according to party or political lines. A sound and continuing effort on the part of present political groups to do something for the old would unquestionably reduce the propaganda value of the more extravagant old-age bonus schemes.

8. What are the principal factors responsible for the increase in the proportion of older people?

First is the extraordinary advance of medicine and public health work in the United States, cutting down mortality at the younger ages of life. The children's diseases have been largely eliminated as causes of death. Typhoid fever has practically been wiped out. Even the tuberculosis and pneumonia death rates have been reduced to small fractions of what they were 50 years ago. The effect of these savings in lives has been to bring more and more people into the older age brackets.

Another factor has been the marked decline in the birth rate; between 1900 and 1940 it fell by about one-third. It is true that we experienced an upswing in births in the war and postwar decade of the 1940's, but even at its recent peak the birth rate did not reach the level of before the first World War. A reduction in the relative number of children automatically means an increase in the relative size of the old-age group.

Finally, the drastic cut in immigration since 1924 has had a twofold effect on the proportion of our population who have reached old age. It not only did away with a major source of young adults but also added to the drop in the birth rate, because immigrants had formerly tended to raise large families.

As a combined result, therefore, of the control of disease, the decline in birth rate, and the cut in immigration, there has been a decided shift in the age distribution of the population. The proportion of young persons has diminished, and the proportion of old has grown.

9. What proportion of the newborn may expect to reach old age?

Under present conditions of mortality, about two-thirds of the newborn babies should live to their sixty-fifth birthday. With mortality conditions prevailing at the beginning of the century, only two-fifths of the newborn babies could have been expected to survive that long.

10. To how many additional years of life may persons aged 65 look forward?

The average number of years of life remaining for white men 65 years old is 12, and for white women of the same age it is 14. The more vigorous will probably live much longer than the average, and the average itself may increase as advances are made in medicine and public health. Old age is no brief period but one of sizable duration.

It is a period which, because of its length, requires consideration in substantial terms.

11. Is the human life span increasing?

The outside limit to human life is uncertain, but authenticated cases of persons exceeding 100 years are extremely rare. The social and scientific factors which have increased the proportion of aged have not pushed back this rough limit of 100 years but have increased the number who more nearly approach it.[1] The goal of geriatric medicine is not basically the extension of the human life span, but rather the improvement of health during life. Drs. G. M. Piersol and E. L. Bortz have expressed it well: "The society which fosters research to save human life cannot escape responsibility for the life thus extended. It is for science not only to add years to life, but more important, to add life to the years."

12. Has there been progress recently in reducing the mortality of the old?

There has been progress in reducing mortality even among persons 75 years old and over, but it has been much less spectacular than the gains made among the young. Within the first half of this century, the mortality of those 75 and over has been cut by about one-fifth, but among those aged five to 14, the death rate has been reduced by more than four-fifths. Nonetheless, the decrease at the higher ages is a remarkable achievement.

13. What is the sex ratio among the old?

Old women outnumber old men. Even in 1870 there were more women aged 75 or over than there were men, although it was not until the census of 1940 that women outnumbered men at ages 65 to 74. The preponderance of women among the old is a result of the lower mortality of women than of men at every age. According to the 1950 census of the population, there were only 877 men for every 1,000 women aged 65 to 69; 887 men for every 1,000 women from 70 to 74; and 827 men for every 1,000 women aged 75 or more.

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[1] See answer to Question 1 of Chapter XXIV, page 386.

14. What are the main sources of income of the old?

The old receive their incomes in a variety of ways. Almost one-third receive their income from current employment, either as earners or wives of earners. Somewhat less than one-fourth receive an income under the Old Age and Survivors' program of our social security laws or under the Railroad Retirement scheme also operated by the government. The proportions with income under our veterans' program, Federal Civil Service Retirement and other forms of federal benefits are rather small. Altogether not far from one-third of our aged are receiving current income payments directly from the federal government. Somewhat over one-fifth are being supported by public welfare funds. At present, pensions from private industry are providing income to only about 2 percent of the aged. To the sources of support just enumerated should be added such items as bank savings, insurance, government savings bonds, and various forms of current investment income. It has been estimated that about nine-tenths of the aged men and about one-half of the aged women currently receive cash income from one source or another.

15. What is the income of the aged?

One-half of the aged males living in cities received an income of $1,300 or more in 1949; this relates only to persons receiving a money income. The corresponding figure is, of course, much smaller for women and for those living in rural communities. However, in the latter, income received in kind, such as farm products, is an important source of support. Payments under the Old Age and Survivors' insurance program still are at a rather low average level, about $43 a month for single persons and about $45 for the married.

16. What are the insurance benefits payable to the aged under the revised Social Security Act?

Under the Old Age and Survivors Insurance (OASI) feature of the act, a monthly benefit is now available to retired workers in covered occupations, to their wives, widows, and surviving parents. These benefits become payable at age 65, provided the retired worker has been in a covered occupation for a prescribed period and, if under 75, his monthly earnings while receiving benefits do not exceed $50. The monthly benefit paid the retired worker is based on his average monthly wage, being 50 percent of the first $100, plus 15 percent of the next $200. This monthly benefit to the retired worker is increased 50 percent if he has a wife 65 or over. His widow receives 75 percent of his monthly benefit if she is 65 or over; the same is paid to aged and dependent surviving parents if there is no widow or dependent child.

The new Old Age and Survivors Insurance System covered about 60,000,000 persons at the beginning of 1951. About seven and one-half million are covered by other retirement programs sponsored by government; among them are federal, state, and municipal employees, the armed forces, and railroad workers.

17. What is the nature of the old age assistance plans under the Social Security Act?

Under the Social Security Act, federal funds are available to the states to help them give assistance benefits to aged indigent persons, usually those 65 or older. Although the state assistance plans must meet certain federal requirements in order to receive social security grants, the states fundamentally control their own programs. There is a wide variation in the average benefit paid. In February 1951, the average monthly old-age assistance payments ranged from $67.52 in California to $18.39 in Mississippi.

18. What does the support and care of the elderly now cost the country each year?

The figure runs well up into the billions. Old-age assistance alone came to more than $1.4 billion in the fiscal year 1949–50. Additional federal contributions to various retirement programs and veterans pensions for those over 65 would bring the figure to well above two billion dollars. There is, furthermore, the cost of state and municipal hospitals in which so many aged stay. Added to all these government expenditures, of course, is an equally staggering sum paid by private charitable organizations, and by individuals.

19. How are the aged housed?

In 1950, over 96 percent of the aged lived in households, either alone or with some other person, related or not. Almost four-fifths had some family life, in that they were living with someone related either by blood or marriage. Well over half were household heads.

Few communities have made even a beginning in providing the kind of housing old people require. For the most part, they are left to their own devices. Many need special accommodations, and in a few large cities private philanthropy has led the way by making available apartment buildings designed specifically for the old. Quarters in these are supplied both for couples and single persons, who have privacy in their own apartments and social contacts with others of their own age in the dining and recreation rooms. There is a trained social worker at the apartment house, and medical and nursing care is provided when needed. Many of the old pay their own way, but those who can contribute only part or even nothing at all are on an equal footing with the paying residents. Unfortunately, few of these houses are in existence and the waiting lists are long.

20. What facilities are there for the care of the elderly disabled?

The old make up the largest group of patients in hospitals for the mentally ill and for those with chronic disease. Even among the patients in general and tuberculosis hospitals they constitute a much larger share than in the population as a whole. The shortage of hospital beds of all kinds in the country for the care of the aged and sick is severe. At the beginning of 1950, there were only 33,800 acceptable beds available in the United States for chronic patients (not counting tuberculosis patients), according to reports received by the Public Health Service. At that time it was estimated that an additional 260,000 beds were needed. The shortage in facilities for care of the mentally ill was equally severe, with the deficit amounting to more than 300,000 beds.

In the face of such a lack of institutional facilities, the largest measure of care for the old must obviously remain in the hands of the private physician. An important part can also be left to local voluntary health agencies working in cooperation with the medical professions. Experience indicates that a special type of institution is needed for the old and chronically ill, differing both from the custodial home and from the expensive general hospital. An interesting experiment conducted at Montefiore Hospital in New York indicates that many old persons who are ill and disabled can be well taken care of in their own homes and at less cost than in the hospital. This scheme requires an organized service of physicians, visiting nurses, housekeepers, and social workers. Although such home-care plans might help relieve some of the hospital bed shortage and cut down the waiting time for those who do require hospitalization, they do not change the general picture of an overwhelming shortage of facilities to care for those who are old and sick.

21. What is the frequency of invalidity and disability among the aged?

Invalidism increases rapidly with age. The National Health Survey showed that only 1 in 100 persons at ages 35 to 44 was an invalid, but more than 5 out of 100 at ages 65 to 74 were so classified. The annual frequency of disabling illness lasting at least a week was 279 per 1,000 individuals among those 65 and over, almost twice the figure for those aged 15 to 64. Disabling sickness also lasts longer among the aged. The average duration of disabling disease for the elderly was 131 days per case, just twice the figure for those at ages 15 to 64.

22. What are the leading causes of death among the old?

Diseases of the heart are by far the most important and together account for over 40 percent of all deaths among those 65 and over. Cancer is second as a cause of death, accounting for almost 14 percent of the total. Then follow cerebral hemorrhage with over 12 percent of all deaths, nephritis with about 7 percent, and accidents with over 4 percent. These five causes account for practically four-fifths of the deaths among the aged.

23. What are the principal illnesses among the aged?

In a family survey, it was observed that over 30 percent of the aged suffered for a day or more from some respiratory condition in the course of a year. Almost 25 percent had a degenerative disease causing illness for at least one day and about 12½ percent were sick at some time from a digestive condition. Six percent suffered from a rheumatic or related condition, almost 3 percent from a skin disease, and 2 percent from a nervous disease. Over 8 percent were ill a day or more because of accidental injuries. It is worth noting that many of these common illnesses among the aged are not prominent as causes of death.

24. How does illness in the old differ from that in the young?

In youth, most diseases are sudden in onset and short in duration. They are most often ascribable to some specific cause, such as bacteria or virus, ordinarily introduced from outside the body. And in a great many cases, the course of disease in the young might be compared to the outline of a mountain, rising to a peak and then falling off again rapidly. Many of the diseases of youth are limited by the immunization which the body automatically builds up against them.

In old age, disease is likely to be the opposite in almost all respects. Most ailments in later life are long drawn out; they come on slowly and gradually; their cause is often obscure. Frequently, ailments in old age are the result of a number of hidden factors which produce great individual variation in the symptoms and the course of the disease. Instead of building to a peak and then falling off, illness in later life is more likely to be unnoticed at onset, very gradual in progression and to be of such a nature that the body cannot build up an immunity to it.

25. Do the diseases of old age have their origin in earlier periods of life?

According to Dr. Edward J. Stieglitz, "All these disorders begin silently . . . They exist, frequently, for years, before they are grossly detectable. Though the incidence of *discovered* cases of vascular diseases rises sharply after forty years of age, the changes started years earlier. These are fifth column diseases, silent saboteurs. To be discovered early, they must be searched for."

26. Can the disabilities of the aged be postponed or controlled?

Many of them can. Diabetes, for example, when diagnosed early and treated properly, results in practically no disability, and the onset of complications may be postponed. Likewise, some of the other chronic diseases can be controlled if detected soon enough, although few of them can be cured. Even high blood pressure, hardening of the arteries, and arthritis can be arrested if they are discovered in time and are properly taken care of. Control of chronic disease often requires adjustments in the living habits of the individual; it is not merely a matter of taking medicine.

27. How important to the health of older people is the maintenance of proper weight?

Probably no other physical factor is more important in controlling the chronic diseases of old age as maintenance of proper weight. Contrary to common belief, it is not normal to continue to gain weight steadily throughout life. At age 25, structural growth has usually ceased. After that, putting on weight above the level required for a person's particular body build is likely to impair health and even to shorten life. Diabetes and many of the circulatory diseases are much more frequent among overweights than among persons of proper weight. Habit may keep old persons eating the same size meals they needed when young, despite the fact that age has reduced their activities and therefore their food and energy requirements. The old saying that many people dig their graves with their teeth has a lot of truth in it.

28. Is mental disease found more frequently among the aged than the young? [2]

29. What are the common emotional problems of the elderly?

A lonesome and unwanted feeling is the most common emotional problem of the elderly. As one gets older, the circle of friends and associates is reduced by death, and activities are of necessity curtailed. Modern industry and business have a tendency to retire the old worker. The modern family, epecially in the city, also has little room for the older generation. Statistics cannot measure the meaning of aging in these terms, but the unhappiness brought on by feeling rejected is certainly a fundamental aspect of all the problems of old age. It is difficult even to save the life of a sick man who would just as soon die as not. No government can make up for the feeling of having been left behind by life. It is the common fact of rejection by business and by family which so often and so seriously affects the old.

30. Are the old often unjustifiably placed in institutions?

Almost one-quarter of the patients admitted for the first time to mental institutions are suffering from senile psychosis or psychosis resulting from arteriosclerosis. Since these diseases are largely incurable, these patients are seldom discharged. Many of these older mental hospital inmates are not insane, but are rather forgetful, irresponsible, and often unable to take care of themselves. Most general hospitals will not accept such patients, and the private nursing homes which do are beyond the financial means of the majority of the old and of their families. Keeping a senile person in a small household is a chore and a responsibility not many families wish to undertake. As a result, the senile are too frequently committed to mental institutions because there is no other place for them to go.

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[2] See answer to Question 9 of Chapter XX, page 315.

31. Do many of the old work?

Beginning with age 65, the proportion of persons working drops off sharply. About nine-tenths of the men in the country 45 to 64 years old are employed, but fewer than half of those aged 65 and over. Among the women, the contrast is even greater. There are many reasons why so few old persons work. Some are physically unable to; some have pensions; some are urged to retire by relatives or friends who support them; but too many cannot find employment when they seek it. It is significant that the occupation group having the best record for continued work far into old age is farming, where most of the oldsters are self-employed. Another field where older workers do have a fair chance is in the highly skilled trades, such as diemaking, cabinetmaking, or boatbuilding. In commerce and in most manufacturing, there is a widespread prejudice against the employment of anyone past 65.

32. Do the old make valuable employees?

In one survey of industrial concerns, three-quarters said that older workers produced as much as younger workers, and in another study the majority of companies said the older workers turned out a better quality of work. One precision instrument firm in New York State, for example, has a policy of hiring older men and even trains them for new jobs. A gun company headed by a president past 75 also makes a practice of employing older people. Most firms, whether or not they do have large groups of old men and women working for them, concede that the old are more loyal than the young. In general, they are also likely to be more thorough and careful, and they often have knowledge and skill that only many years of experience can build.

That age does not necessarily put an abrupt stop to usefulness is illustrated by the lives of innumerable famous men and women who have made important contributions to society after passing 65. Scientists like Einstein and Irving Langmuir, the Nobel Prize winners, statesmen like Herbert Hoover and General Marshall; and many of the current leaders in all fields are old men chronologically but still young productively.

33. Do older workers have more accidents than young ones?

Contrary to the general impression, old workers are not more likely to have accidents than their younger associates. A study by the Bureau of Labor Statistics showed that the industrial accident rates for the old were below those for the working population as a whole, and that the average length of disability from industrial accidents was nearly the same for older workers as for all workers. The worst accident records were made by young workers still in their teens or early twenties.[3]

34. Are absences because of illness more common among the old than the young.[4]

35. How are current pension plans both an aid and a threat to the elderly?

Pensions provided by retirement plans are an important aid to the old. However, the requirement written into so many plans that workers quit at the age of 65 may be a handicap to the elderly who seek employment. Finding work is hard enough in normal times, even for younger persons, but the man past 65 often faces strong prejudice against him. In fact, many surveys show that the age prejudice begins to be important at around 40. The loss of useful activity is a threat not only to a person's morale but also to his mental and physical health.

36. How widespread are pension and retirement plans in American industry?

About 8,000,000 of the working population of the country are covered by some commercial pension plan, and there are about 15,000 such private retirement plans. There is no question that retirement plans are growing at a tremendous pace and that, properly set up, they will be a boon to the welfare of the aged.

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[3] See answer to Question 12 of Chapter XVI, page 246.

[4] See answer to Question 37 of Chapter XVIII, page, 286.

37. What can be done to stimulate employment of the elderly?

The biggest part of the job is in public relations. Business doesn't hire out of charity. It must be convinced that it will be able to operate profitably with a greater proportion of older workers. This requires surveys of the available skills and aptitudes of old workers, and also of the jobs in different industries for which the old are best suited. Small scale demonstrations with old workers should be valuable. Every old and still useful man who leaves work reduces the nation's productivity and at the same time requires added work on the part of others for his support.

38. What can the community do about the old?

The first and basic step toward helping the old is to take an interest in them. This is where the local community has its chance. Many of the old are self-reliant, and others are well cared for by their families. Some may need special attention. All, however, would gain by having the town or city where they live concerned with their welfare.

Care for the old requires, of course, an organization, or perhaps a number of them. Use of the skills and advice of the old will usually result in many improvements in the community, so that helping to solve the problems of old age will not be a one-way affair.

39. What part can health officers play in serving the older population?

The local health officer is the logical coordinator of the activities of voluntary health groups, the medical professions, and the various federal and state health agencies. The chief causes of death today are the conditions affecting middle and old age. In working with the old, therefore, the health officer will also be dealing with some of his major health problems.

One of the most urgently needed steps is to set up a system for early diagnosis of the chronic diseases before they result in serious disability. In some places (Massachusetts and New York City, for example) a start in this direction has already been made in cooperation with the Public Health Service. Large-scale detection drives probably require the help of the state health bodies, but the local health officer is the one who will have the responsibility for most of the chronic cases which are discovered. With the progressive aging of the population, the health problems of the old will inevitably take a larger share of the work of the local health department.

40. Can the individual prepare for old age?

The individual himself can help avoid many of the troubles of old age by preparation in advance. Regular medical examination through the adult years of life could mean that chronic disease, if it developed, would be lessened in amount and in severity. Planned savings to supplement Social Security benefits and pensions could bring self-sufficiency. The development, during earlier life, of interests and hobbies could make the period of old age not only busy but a'so useful and satisfying.

The personnel departments of industry could help older workers in preparing for retirement. The larger companies might even have old-age counselors to arrange classes for those in their sixties. Clubs might, be organized for the development of hobbies and special skills. Communities might also provide old-age counseling as part of their welfare and recreational services.

41. Have the old at times been discarded as well as looked up to?

In different civilizations old age has been reviled or revered, and the old eaten or made rulers. Primitive cultures have often found that death was the quickest solution to the problem of persons too old to work or fight. Eating the aged was even said at times to prove reverence for them. The Fiji Islanders, afraid of losing their physical strength, used to commit suicide when they thought old age was creeping up. In the Gran Chaco there once was a custom requiring the son to strike down his father before the father became weak.

Greece and Rome were divided on the subject of the old. Some poets wrote of the fear of aging and the worthlessness of life in old age. Solon, on the other hand, said (when over 60) that life ought to continue until 80. In Sparta and Athens the old were given positions of great esteem and importance. In Rome for a while there was a saying, "To the bridge with the men of 60," meaning dispose of the worthless old men. In contrast, however, was the Roman senate, a body of old men picked for their wisdom.

Certainly in this country the aged have often been looked up to. Six presidents were past their sixtieth birthday when they took office, and 16 Supreme Court justices were appointed when at least that old.

42. Why are the old important to society?

The importance of the old is not to be measured by their numbers. Their experience and wisdom can help stabilize the social order. Naturally conservative, they balance the venturesome spirit of youth. Their accumulated knowledge can provide guidance for the state. They can be a uniting and strengthening force in family life, adding continuity and the feeling of being rooted. The way in which a society treats its old is a good indicator of its sense of responsibility and its breadth of vision.

XVI

THE ACCIDENT TOLL

1. What do accidents cost the nation in life, limb, and money?

Accidents take an appalling toll of life, limb, and money in the United States. Each year, close to 100,000 persons are killed and about ten million are injured seriously enough to become disabled for one day or more. Not far from 400,000 of the injured suffer permanent impairments ranging from the loss of a part of a finger to complete crippling. It is a sobering thought that every three seconds somewhere in the United States someone is injured more or less seriously, and every five minutes someone is killed in an accident. The money cost has been estimated at around seven billion dollars annually. This includes loss in wages, medical expense, overhead cost of insurance, property damage in motor vehicle accidents, fire losses, and other direct and indirect costs.

2. Is life safer today than it was a generation ago?

In spite of the large losses from accidents recorded annually, life in our country is safer now than it was a generation ago. In relation to the size of our growing population, the number of deaths from accidents has been declining. The death rate from this cause in 1948 was 67.1 per 100,000 population, the lowest ever recorded for the United States. Around 1910, the accident death rate averaged about 80 per 100,000. If the situation of 1910 had continued without change, accidents would currently claim upward of 25,000 additional lives each year among the American people.

3. What proportion of all deaths is due to accidents?

Accidents account for about 7 percent of the total deaths in the United States each year. In 1948, of the 1,444,337 deaths from all causes, 98,001 were due to accidents of all kinds.

4. How does mortality from accidents compare with that from the natural causes?

Accidents rank fourth among the leading causes of death. Only diseases of the heart, cancer and other malignant tumors, and cerebral hemorrhage take a greater number of lives. Ranking below accidents are such major causes of death as nephritis, pneumonia and influenza, tuberculosis, and diabetes mellitus.

5. Where do most accidents occur?

Home accidents cause by far the largest number of nonfatal injuries. More than half of the ten million disabling injuries and more than one-third of the fatalities due to accidents are caused by mishaps in and around the home.

6. What types of accidents cause the greatest number of injuries—falls, motor vehicle accidents, burns?

Motor vehicles cause about one-third of all accidental fatalities. Falls are second in importance, accounting for one-quarter of the total. Drowning, which ranks third, is the cause in about 1 in 20 accidental fatalities. Not far behind in order of importance are burns.

The causes of nonfatal accidents for the country are not fully known. One study of comparatively serious nonfatal injuries—those disabling for a week or longer— showed that, in an urban population, falls accounted for about one-half and automobile accidents for about one-fourth of all the injuries. Cutting and piercing instruments and burns are also responsible for relatively large numbers of serious injuries.

7. Are more males than females killed in accidents?

The adventuresome male has more than twice the chances of the female of being killed by accident. In 1946, the accident death rates for males and females were 97.7 and 42.8 per 100,000 respectively. Few causes of death record as wide a difference in the death rates for the two sexes. Moreover, the mortality rate from accidents is higher among males than among females at each age period from birth up to 75 years; after that the situation is reversed. The difference is greatest at ages 20 to 24, where the accident death rate for males is six times that for females. The greatest excess male mortality, as one would expect, is found in mishaps which arise largely out of occupational activities, and is most marked in mining, agriculture, air and railroad transportation accidents. The types of accidents associated in large part with sports and recreational activities are also much more common among males than among females. This is particularly true of firearm accidents and drownings. Of all the main types of accidents, falls alone show a lower death rate for males than for females, but the difference is not marked. (See Chart 17.)

TYPE	CRUDE DEATH RATE PER 100,000		*MORTALITY RATIO- MALES TO FEMALES*
	White Males	White Females	
FIREARMS	3.1	.5	*6.2*
DROWNING	6.5	1.1	*5.9*
MOTOR VEHICLE	38.0	10.7	*3.6*
ACCIDENTS (all forms)	97.7	42.8	*2.3*
POISONOUS GAS	1.9	.9	*2.1*
CONFLAGRATION	2.2	1.4	*1.6*
BURNS (except conflagration)	3.5	2.7	*1.3*
ACUTE POISONING	1.2	.9	*1.3*
FALLS	15.9	18.6	*.9*

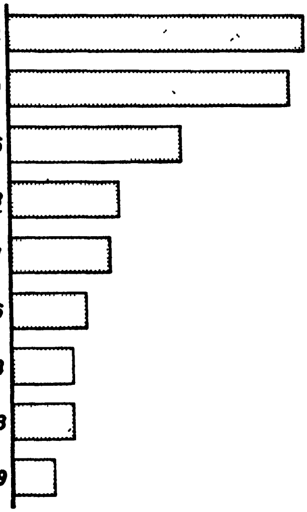

Chart 17. Sex ratio of mortality from specified types of accidents, white persons, United States, 1946

8. Are more males than females injured in accidents?

Accidental injuries disabling for a day or more are one and three-quarters times as frequent among males as among females, according to the findings of one study covering white families in 18 states. Disabling injuries occurred at the rate of 46.6 per 1,000 males and 25.8 per 1,000 females. However, the male excess was found only at ages under 65. It was most marked at ages 15 to 24 years, when the male rate was two and one-half times the female rate. At ages 65 and over, the rate for females exceeded that for males by about 50 percent.

9. Are accidents more frequent among the old than among the young?

Mortality from accidents is highest in old age. It is also very high in the first year of life. Among males, the death rate from accidents is lowest at ages five to 14. At these ages, accident mortality is also low among females, but their lowest rate is recorded at ages 25 to 34 years. The variation in the death rates from accidents according to age and sex for the general population of the United States in 1948 is shown below.

Death Rates from Accidents per 100,000 Population, According to Age and Sex; United States, 1948

Age	Total	Male	Female
All ages	67.1	92.5	42.0
Under 1 year	108.3	119.7	96.5
1–4	41.2	47.7	34.4
5–14	24.6	34.3	14.7
15–24	55.4	92.1	19.2
25–34	45.2	78.4	14.0
35–44	48.2	80.4	17.2
45–54	56.6	92.7	21.0
55–64	77.9	118.8	36.8
65–74	150.7	193.4	110.5
75 years and over	568.5	511.7	615.5

In one study of nonfatal accidental injuries disabling for a day or more among members of white families in 18 states, the frequency of injuries was highest among males at ages 15 to 19. Among females, there was a peak at ages 10 to 14, but the rate was highest at age 65 and over.

10. What age is the safest from fatal accidents?

Among members of insured wage earners' families, most of whom live in urban areas, accident fatality rates are at a minimum at ages 8 to 12 years. At age 11 the chances of sustaining a fatal accidental injury is less than at any other time of life.

11. What types of accidents are most frequent in childhood?

Among infants, two types of fatal accidents are of particular importance—mechanical suffocation by bed clothes, pillows, etc., and obstruction, suffocation, or puncture by ingested objects. These two causes account for two-thirds of all accidental deaths among the children under one. At ages one to four, when youngsters begin to play in and around the home, the pattern of fatal accidents changes. Among these preschool children, motor vehicle mishaps outnumber all other types of fatal accidents and account for more than one-fourth of the total. Burns and scalds, conflagrations, and drownings each contribute about one-eighth of the deaths.

Within the school ages 5 to 14 years, motor vehicle accidents contribute about two-fifths of the accidental deaths and drownings about one-fifth. Injuries by firearms, burns, and conflagrations are other significant types of accidents among these youngsters. At ages 15 to 19, motor vehicle fatalities account for more than half the total number of accidental deaths; drownings, next in importance, make up one-eighth of the total. Firearm accidents are also an important element in the accident mortality at these ages.[1]

12. What types of accidents are most frequent in early maturity, in midlife, and in old age?

In early maturity (ages 20 to 44), motor vehicle accidents cause about two-fifths of all accident fatalities. Other important types of accidents are drowning, air transportation, falls, burns, railroad accidents, and firearms. At ages 45 to 64, motor vehicle accidents account for more than one-third of all accidental deaths, and falls for about one-sixth. Burns, drownings, and railroad accidents are also significant causes of death at these ages.

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[1] See answer to Question 23 of Chapter XIV, page 218.

In old age, ages 65 and over, falls are by far the leading cause of accidental death, accounting for about three-fifths of all such fatalities. Motor vehicle accidents cause nearly one-fifth of such deaths.

13. Are fatal accidents more frequent in summer than in winter?

The summer season is consistently the most hazardous time of the year. In 1948, a typical postwar year, there was a daily average of 281 accidental deaths during the months of June, July, and August. In the spring months the average daily death toll was at a minimum, 251 per day. The averages for fall and winter were 267 and 272 deaths per day, respectively.

14. Are fatal accidents more frequent in urban than in rural areas?

Our only information on this score for the country as a whole is limited to 1940. In that year, the risk of accidental death was slightly higher in urban areas as a whole than in rural areas. The death rate from accidents was 74.5 per 100,000 in urban areas and 72.4 per 100,000 in rural areas. Mortality from accidents was highest in communities of 2,500 to 10,000 inhabitants, where the rate was 91.7 per 100,000.

15. What part of the country has the highest mortality from accidents?

Accident prevention is an important public health problem everywhere in the United States. The most populous states, as might be expected, are the heaviest contributors to the national toll of about 100,000 lives taken annually by accidents and, from that point of view, have the greatest problem. Many of the smaller states, however, contribute far more heavily in proportion to their population than do the larger states. Nevada, the state with the smallest population, oddly enough, has by far the highest accident fatality rate, whereas New York State has one of the lowest.

The Mountain states have consistently recorded the highest accidental death rates. For the most part, the states with the lowest rates lie along the northern part of our Atlantic seaboard.

16. What do home accidents cost the nation?

Accidents in and about the home in 1948 claimed about 35,000 lives. It is estimated, moreover, that injuries in the home account for over half of the approximately 10,000,000 persons who are more or less seriously injured in accidents each year. Wage loss, medical expense, and overhead costs of insurance attributed to home accidents amount to about $700,000,000 annually.

17. What types of fatal home accidents are most frequent among men and women?

Falls are by far the leading cause of fatal injury among both males and females, according to a survey of fatal home accidents in a limited area of the country. About 70 percent of the accidental deaths among females and 45 percent of the accidental deaths among males resulted from falls. Fire accounted for 12 percent of the deaths among females and for 15 percent of the deaths among males. Suffocation and strangulation was the third largest cause of accidental death for both sexes, accounting for 8 percent of the female deaths, and for 13 percent of male deaths. The fourth most important cause of accidental death among females was poisoning. Among males, firearm accidents in the home were fourth but closely following were gas poisoning fatalities.

18. Are more women than men killed in home accidents?

Surprising as it may seem, the death rate from accidents occurring in and around the home is higher among men aged 15 to 64 years than among women of these ages. In fact, the male death rate at these ages was the higher by about 50 percent according to a study of home accident fatalities among insured members of wage earners' families. After age 65 women have much the higher accident death rate.

19. What types of fatal home accidents are most frequent among children of preschool age and of school age?

Among children under five years, the most common cause of fatal accidents in the home is mechanical suffocation, with the injury being ascribed usually to pillows or bedclothes or to overlaying. In 1947, about 5,900 preschool children were killed in home accidents, and about 1,700 of them, virtually all less than one year old, died as a result of mechanical suffocation. However, in the opinion of some medical investigators, unrecognized respiratory conditions underlie a large number of deaths that are certified as due to mechanical suffocation. Not far behind in number are deaths from burns and scalds conflagrations and scalding due to upsetting or falling into hot liquids cause most of these deaths. Falls, drownings, and ingestion of poison-containing compounds are also responsible for a large number of home accident deaths among young children.

At the school ages from 5 to 14 years, burns and conflagrations head the list of causes of accidental death in the home. These two types of accidents together account for about 650 of the approximately 1,500 fatal home injuries among school children. Firearm accidents and falls are also important causes of death at that period of life.[2]

20. In what part of the home do most fatal accidents occur?

More persons are fatally injured in the bedroom than in any other part of the house. According to one study which covered only a limited area of the country, 32 percent of all accidental deaths in the home occurred in the bedroom, 14 percent in the yard, 13 percent on stairs, 12 percent in the kitchen, and 7 percent in the living room. The bathroom, the dining room, and the porch each was the scene of 4 percent of the injuries.

Another study, based on the mortality of a group of Industrial insurance policyholders aged 15 to 69 years, showed that one-fourth of those who lost their lives in home accidents were killed in the bedroom. Half of the fatal injuries in the bedroom were caused by poisonous gases and conflagrations often originating in other areas of the house, including the kitchen. Among women, the kitchen was the scene of the second largest number of fatal injuries, accounting for about one-fifth of their home accidents. Only a slightly smaller proportion of insured women were fatally injured on stairs and steps.

Among insured men, second in importance as the scene of fatal home accidents are the stairs or steps, where more than 20 percent of the total occurred. Accidents in areas around the house—the backyard, the garden, and the driveway—accounted for 15 percent of the deaths among men; and accidents in the kitchen for 10 percent.

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[2] See answers to Questions 11, 12, and 23 of Chapter XIV, pages 215 and 218.

21. What object or agency causes the greatest number of falls in the home?

More than one-third of all falls in home accidents occurred on stairs or steps, according to one study of hospitalized cases. About one-tenth of the falls took place on floors, while falls on walks or on the ground outside the house contributed almost as much. Next in importance were falls over objects—chairs, toys, loose boards, etc., not on stairs—and falls from chairs or tables.

22. What agency causes the greatest number of burns in the home?

Steam, hot water, and other hot liquids are the most important causes of serious accidental burns in the home. According to a study of hospitalized cases, about two out of every five burns sustained in home accidents result from scalding. Burns of this type are especially common among children under five.

Burns by gasoline or other flammable liquids are second in importance, one-sixth being so classified. Most of these accidents occurred among adults who used gasoline for cleaning purposes, or used kerosene to hasten a fire in the stove.

Burns resulting from contact with stoves, pipes, or radiators made up 8 percent of the total; matches, 7 percent; and lye and other chemicals 5 percent.

Virtually all the victims of burns due to matches were children under 15 years of age.

23. What poisons most frequently cause death?

In 1948 alone, over 1,400 people lost their lives as a result of accidental poisoning by solids or liquids ingested in the home or elsewhere. The leading poison was barbituric acid and its derivatives, which accounted for well over one-quarter of the deaths. Wood and denatured alcohol, which two decades ago caused more deaths than any other poison, is now second in importance, causing about one-tenth of all fatal accidental poisonings. Lye and potash ranked third, followed by arsenic and its compounds. Nux vomica and strychnine, which as recently as the late 1930's were the cause of 100 deaths annually, are now of minor importance.

Among very young children, oil of wintergreen (methyl salicylate), a liniment used in many American homes, and kerosene are relatively important causes of fatal accidental poisoning.

24. What do motor vehicle accidents cost the nation?

Each year, motor vehicle accidents kill about 35,000 persons and injure about one million seriously enough to disable them for a day or more. About 100,000 persons, or one in ten of the injured, suffer permanent impairments, some of which are completely crippling. The estimated annual money costs of motor vehicle accidents is in the neighborhood of three billion dollars. This includes well over one billion dollars in property damage.

As many as seven million motor vehicle accidents involve property damage only each year. In about five million of these, the damage is less than $25.

25. Is the motor vehicle toll increasing?

There are many indications that the intensive campaign to control the heavy loss of life from motor vehicle accidents is meeting with a measure of success. On the basis of miles traveled, the death rate from motor vehicle mishaps for 1950 was one of the lowest ever recorded in our country; the rate was then 7.5 deaths per 100,000,000 vehicle miles, or 38 percent below that for 1941. The national toll of 35,000 lives a year is far less than that just prior to Pearl Harbor, when the figure was about 40,000. This reduction was accomplished despite the marked increase both in population and in vehicle mileage.

26. Are more pedestrians than riders killed in motor vehicle accidents?

Each year, about the same number of pedestrians, drivers, and passengers are killed in motor vehicle traffic accidents.

27. Of the pedestrians killed in motor vehicle accidents, what proportion are old people?

About one-third of all pedestrians who lose their lives in motor vehicle accidents are 65 years of age or over, although they account for only about 8 percent of the population.

28. Of the riders killed in motor vehicle accidents, what age group contributes the largest proportion of deaths?

One-fifth of the drivers killed in motor vehicle accidents are between ages 20 and 24 years. These are also the ages with the largest proportion of passenger deaths, but the age group 15 to 19 years is not far behind.

29. Are there more motor vehicle fatalities in urban than in rural areas?

More than twice as many people are killed in motor vehicle traffic accidents in rural areas than in urban areas, despite the fact that traffic volume is estimated to be approximately the same for both. Four-fifths of the drivers and passengers killed in motor vehicle accidents meet death in rural areas. On the other hand, less than half of the pedestrian fatalities occur in rural areas, that is, in places having fewer than 2,500 inhabitants.

30. At what season of the year are deaths from motor vehicle accidents most frequent?

Quite consistently, the death toll from motor vehicle accidents is highest in late fall and early winter. December is usually the heaviest month for these fatal injuries, with about 10 percent of the annual fatalities. In most years November and October approach closely the record of December.

31. On which day of the week and on what holidays do most motor vehicle accident fatalities occur?

Motor vehicle accident deaths are most frequent on Saturday, with Sunday running a close second. These two days together contribute approximately two-fifths of the accidents with fatal outcome. Holidays also are marked by a high toll of motor vehicle fatalities. Christmas Day, or one of the two days preceding it, usually is found to have the worst record for the year. New Year's Day also ranks high.

32. Do young drivers have the worst motor vehicle accident record?

The available estimates indicate that drivers under age 25 have by far the highest rate of involvement in motor vehicle accidents. These estimates, however, do not take account of the amount and kinds of driving done by persons at different ages.

33. Are men safer drivers than women?

There is no satisfactory answer to this question, since available statistical information is very limited. It is true enough that nine out of ten drivers involved in motor vehicle accidents are men, but men also spend a far greater time in driving. Besides, the kinds of driving are radically different for men and women. These and other factors must be taken into account before it can be said with any assurance which one of the sexes makes the better driver.

34. How many persons are killed and injured in occupational accidents each year?

The accident toll in industry in 1950 was around 15,500 killed and nearly 2,000,000 injured. About 80,000 of the nonfatal injuries each year result in permanent impairments, and upward of 1,500 of these are totally disabling.

35. How many working days are lost to industry each year because of occupational accidents?

The actual time lost by workers injured in occupational accidents each year totals about 40,000,000 man-days. In addition, about 230,000,000 man-days are lost because of accidents by workers other than those injured. This figure includes such items as time lost by those who help the injured person, or who stop to discuss the accident, temporary reduction in the efficiency of persons witnessing serious accidents, and suspension of work caused by damaged equipment. These figures alone do not measure the entire cost to the economy in lost production due to occupational accidents in one year. Allowance should also be made for the effects on future production of the years of working life lost by men killed in occupational accidents and for the diminished working capacity of those who suffer permanent disabling injuries. The production time lost each year because of fatal and permanently disabling occupational injuries is around 170,000,000 man-days.

The money cost of occupational injuries to the nation in one year is estimated at more than two and one-half billion dollars.

36. What are the most hazardous industries? [3]

37. Are more workers killed on the job than off the job?

On the average, one worker is fatally injured at work for every two killed off the job. In 1950, about 15,500 workers were killed in accidents on the job and 34,000 in accidents off the job.

38. What are the chief types of occupational accidents?

Falling, sliding, or moving objects are the most common cause of injury in industry. Accidents of this type cause more than a quarter of all occupational injuries according to one study of compensated occupational injuries. The type of accident in which workers are caught in, on, or between machines or objects accounts for 18 percent of all injuries; slips and overexertion for 17 percent, and striking against or bumping into objects for 15 percent. Falls, next in importance, cause 14 percent of the injuries.

39. Do impaired workers have more accidents than unimpaired workers?

If placed intelligently, the impaired are no more likely to experience disabling work injuries than the unimpaired, according to the statistical findings of a recent study. According to this survey, the injury frequency per million exposure-hours was 8.9 for the impaired workers, compared with 9.5 for unimpaired workers exposed to the same hazards.

The study also showed that the average time lost as the result of disabling injuries was somewhat less among the impaired than among their unimpaired co-workers. Further, it was noted that there was a very marked similarity in the kinds of injuries experienced in the two groups. The injuries experienced were related to the hazards of the particular job, not to a proneness on the part of the impaired person to certain kinds of injury.[4]

40. Has the safety movement in industry been successful?

The safety movement in industry has been remarkably successful. Particularly noteworthy are the achievements of the railroads and the iron and steel companies in cutting down the accident toll among their employees. In 1889, one railroad employee in every 357 was killed in an accident arising out of his work; in 1949, the figure had dropped to one in every 2,776 employees. In a select group of iron and steel establishments which had consistently carried on a positive safety program, the accident frequency rate declined over 92 percent between 1913 and 1940.

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[3] See answer to Question 25 of Chapter XVIII, page 282.

[4] See answer to Question 38 of Chapter XVIII, page 286.

Among employees of companies in a wide variety of industries reporting to the National Safety Council, the accident frequency rate declined 29 percent and the severity rate 39 percent between a base period 1935–39 and 1950.

Some individual companies have achieved amazing accident records. A textile plant of E. I. Du Pont de Nemours and Company worked without a disabling injury for more than 28 million man-hours, and a chemical plant of the same company over 17 million man-hours.

41. How large is the accident toll among farm residents?

According to one estimate, 17,500 farm residents were killed and 1,600,000 injured in accidents in 1948. Of those fatally injured, 6,000 were killed in home accidents, 6,500 in motor vehicle accidents, and 4,400 in occupational accidents. Among the last, 800 were motor vehicle casualties. About 1,400 were killed in public non-motor vehicle accidents.

42. Where do most accidental injuries occur on farms, and what are the main types of accidents?

Three sample surveys conducted in a cross-section of the country showed that, of all accidents to farm residents, 16 percent occurred in the home, 22 percent in the barn, 34 percent elsewhere on the farm, and 11 percent on roads or streets. The remainder occurred in other or unknown places. Falls were the leading type of accidents, contributing 25 percent of the injuries; next in order were machinery accidents with 13 percent, and then injuries by animals with 12 percent. Other important types were motor vehicle accidents, mishaps in handling objects, use of hand tools, and stepping on or striking against objects.

43. Which is the safest mode of travel—by railroad, airplane, bus, private automobile?

In the three-year period 1948–50, according to one study, the safest modes of travel were bus and railroad. The passenger death rate per 100,000,000 passenger-miles traveled by bus was 0.18, by railroad 0.25, in scheduled air transport plane 1.3, and in passenger automobile or taxicab 2.1.

44. What are the main causes of fatal falls on streets and sidewalks?

Injuries sustained by slips on ice and snow accounted for well over one-third of the fatal falls on streets and sidewalks, according to one life insurance study of persons of ages 15 and over. Intoxication was a factor in one-fifth of the fatal falls studied. Another fifth was due to the infirmities of age, fainting, epileptic seizures, or to other effects of disease. Among the other causes of fatal falls were tripping on broken or uneven sidewalks, over various small objects, elevated manholes, protruding cellar doors, or slipping on greasy sidewalks, pools of water, and small pieces of fruit. About 5 percent were fatally injured when they made a misstep while stepping up or down the curb, and 3 percent were felled by others.

45. Who are the principal victims of drownings?

The death rate from drowning for males in 1948 (6.2 per 100,000) was nearly six times that for females. Among males, drownings are comparatively frequent at all ages, but the chief victims are boys 15 to 19, among whom the death rate was 10.3 per 100,000. Drownings are negligible among females past the teen ages.

46. How many persons are killed in firearm accidents each year?

Firearm accidents claim more than 2,200 lives annually in the United States, and rank seventh on the list of causes of accidental death. Males are the chief victims, especially at ages 15 to 19 years. The rate of fatal injury for males is seven times that for females.

47. What part does hunting play in the toll of firearm accidents?

One-quarter of the total of firearm accidents occurred while hunting, according to a life insurance study of experience among Industrial policyholders, mostly urban dwellers. However, twice as many were killed in firearm accidents in the home as in hunting accidents. Firearm accidents in public places, exclusive of those occurring in hunting, accounted for almost one-quarter of the total.

48. What are the chances of being struck by lightning?

Lightning kills around 300 persons annually in the United States, or about two in every million of population. The probability of being fatally injured by lightning, however, is far greater in rural than in urban areas. About nine out of every ten fatalities from this cause occur in places with 2,500 or fewer inhabitants, although these areas have only a little more than 40 percent of the total population.

49. What do fires cost the nation in property damage each year?

Property valued at around $743,000,000 was destroyed in fires in 1949, according to one estimate. Of this total $673,000,000 was lost in about 580,000 building fires.

50. What are the chief causes of fires in buildings?

Careless smoking and the careless use of matches caused the largest number of fires in buildings in 1949. Other important causes of fire included defective electrical fixtures, wiring, and appliances; defective or overheated heating equipment; faulty chimneys; rubbish; and lightning.

51. How does the frequency of school accidents vary by grade?

According to one study, injuries to students occurred at the rate of 6.8 per 100,000 student-days, counting only absences of one-half day or more because of accidents in the school building, on school grounds or while going to or from school. The injury rate rose fairly steadily from 2.2 in the kindergarten to 11.1 in the ninth grade, but fell off to around 10 for the higher grades.

52. How many children are killed annually while riding bicycles?

Approximately 400 children 5 to 14 years of age are killed annually while riding bicycles. About 350 of these fatalities occur as a result of a collision with a motor vehicle. The remainder result from falls off bicycles, and from bicycles running into railroad trains and streetcars or into curbs, trees, or other fixed objects.

53. How many persons are killed by electricity each year?

Electricity kills approximately 900 persons each year, most of whom are adult males. As might be expected from the preponderance of deaths among men, the majority of fatalities are sustained in the course of employment.

54. What is meant by a catastrophe?

An accident is generally considered to be a catastrophe when five or more persons are killed.

55. Are catastrophes a major factor in the annual accident toll?

Accident catastrophes in most years take between 1,000 and 1,500 lives, or around 1 percent of all deaths from accidents in the United States. However, there have been years in our history when a single great disaster made catastrophe a much more important item in the total accident death record. Our most devastating catastrophe, the Galveston tidal wave in 1900, alone claimed 6,000 lives.

56. What types of catastrophic accidents have caused the greatest number of deaths?

Conflagrations, burns, and explosions were responsible for 31.2 percent of all catastrophic deaths, exclusive of those occurring in military aviation catastrophes, during the 13-year period 1937–49. Ranking second were the natural disasters—tornadoes, floods, hurricanes, etc.—which accounted for 23 percent of the total. Catastrophic motor vehicle accidents contributed 14.6 percent of the fatalities, catastrophes in civil air transportation 8.5 percent, and catastrophic accidents in mines and quarries 8 percent.

XVII

SUICIDE AND HOMICIDE

SUICIDE

1. How many suicides occur in the United States each year?

More than 16,000 people annually have put an end to their lives in recent years. In 1948, there were 11.2 suicides for each 100,000 population. In addition to the officially recognized suicides, a considerable but unknown number of such deaths erroneously are classified in vital statistics records as accidents.

2. Are there many unsuccessful attempts at suicide?

Added to the 16,000 people who end their own lives, there are at least tens of thousands who find life so difficult that they make an attempt to kill themselves.

3. How does the suicide rate in the United States compare with that of other countries?

The highest rates just before World War II were found in Austria, Germany, Czechoslovakia, Hungary, and Switzerland, where they averaged almost twice that in the United States. The lowest rates were recorded in Eire, Northern Ireland, some of the Central and South American countries, Italy, Norway, and Spain, where they ranged from less than a quarter to between a third and a half of the rate in the United States. In England and Wales, suicide is slightly less frequent than here. In the Orient, suicide is not looked upon with as much disfavor as in the West; in fact, in some places it is thought, under certain circumstances, to bring honor to one's family. The suicide rate in Japan averages about one-third above that for the United States.

4. Is suicide more frequent among men than women?

Men are much more likely to kill themselves than are women. In the United States, male suicides have usually outnumbered female suicides by slightly more than three to one. The excess of male suicides is found among both the white and colored races.

5. Is suicide attempted by more men than women?

Women attempt suicide more often than men, but they are less frequently successful. These failures may be largely the result of their choice of less violent and disfiguring methods, which are also less apt to prove fatal. It is an open question whether women choose less effective methods because they are not so determined to die, or because they are more accessible, or perhaps because they involve less violence. Also, many women who attempt suicide may not be entirely sincere in their purpose; very frequently their suicidal arrangements seem so planned that rescue is not only possible but even probable.

6. How do the suicide rates for whites and nonwhites compare?

For the country as a whole, the rate among white persons is almost four times that of Negroes. In the Northern states, where both Negro and white rates are higher than in the South, the difference is somewhat less than the average for the country.

The suicide rates for the Japanese and Chinese in this country range from two to three times that of whites. American Indians have somewhat more than half the suicide rate of the white population.

7. At which ages is suicide most frequent?

The frequency of suicide increases rapidly with age, particularly among men. More than half of the women who commit suicide and nearly two-thirds of the men are 45 years of age or over.

Children rarely kill themselves. After the period of adolescence, when the suicide rate is below one per 100,000 for either sex, the rate for white men rises steadily to a peak of about 80 per 100,000 at ages 85 and over. Colored men show a less distinct pattern, with the rates at a considerably lower level. Among white women, the frequency of suicide is highest in middle and old age.

The age pattern of unsuccessful suicides is considerably different. Special studies show that more than half of the women, and a quarter of the men who make ineffectual attempts to kill themselves are under 30 years of age. In each sex, the chance that an attempt at suicide may end fatally increases with age. Among women, the chances of success are only one out of 18 at ages under 25, but at ages 50 and over they are one out of two. One out of six attempts by men under 25 succeeds, whereas at ages 50 and over the chances are two out of three.

8. How does suicide among the married compare with the unmarried?

Married people, and especially those with children, are less inclined towards suicide than either those who have never married or those who are widowed or divorced. The latest available data, for 1940, show that single men have a suicide rate one and two-thirds times that for the married, while for widowers the ratio is three and for the divorced it is four. Among females, the corresponding ratios of suicide are at a lower level; for the single the ratio is about one and one-third times the married, for widows one and two-third times, and for the divorced three and two-third times.

9. Is suicide more frequent in some parts of the country than in others?

Although the rate for the country as a whole was 11.2 per 100,000 in 1948, the regions had rates ranging from 7.6 in the South Central states to 16.3 in the Pacific Coast states.

10. What are the chances of death from suicide?

According to the situation in 1939–41, it is estimated that 16 white males and 5 white females out of every 1,000 born would eventually take their own lives; for the nonwhites, the corresponding figures are much lower, 4 per 1,000 for males and 1 per 1,000 for females.

11. What is the effect of war on the suicide rate?

Practically every belligerent country, and in some instances the neighboring neutral countries as well, experience declines in suicide during wartime. In the United States, the suicide rate dropped by one-third from 1915 to 1920, the period containing World War I, and it dropped again by one-third in World War II years 1943 and 1944, compared with the three years preceding Pearl Harbor.

It is commonly thought that this wartime drop in suicides lies in the tendency for personal worries and discouragements to be pushed into the background during such periods of general stress. The needs of the country become paramount. People live for the present and worry less about the future, especially as new channels of activity are opened to them because of demands for both military and industrial personnel and also because of the spurt in the money income of many people.

12. What are some of the principal motives for suicide?

There are many motives for suicide, but they are often very difficult to unravel. The reasons most often indicated by the person who commits suicide or by the family are ill health, economic distress, the loss of a loved one, and domestic discord. Behind all these immediate considerations are found almost invariably certain emotional attitudes: fears and anxieties, a sense of inferiority or insecurity, hatred, aggressiveness, guilt, frustration, or revenge. The final circumstances leading to a suicide come usually at the end of a long chain of contributory events and may in themselves not be closely related to the underlying cause for the individual's attitude.

13. Are the suicide motives of men different from those of women?

Ill-health is most frequently given as the motive by men, with domestic difficulties second. Among women the order is reversed. Together, these two reasons are estimated to account for almost three out of every four suicides. Unrequited love or other frustrated love affairs are relatively rare as the stated cause of suicide—in only one in ten attempts at suicide by women and in only a negligible proportion of the attempts by men.

14. What are the most common methods of suicide?

About four-fifths of those who die by their own hand use one of four methods—shooting, hanging, poisoning, or asphyxiation by gas. Although this proportion has remained practically unchanged in the past quarter century, there have been changes in the relative importance of the individual means, with shooting and hanging on the increase.

There is a marked difference in the relative frequency of the methods used by the two sexes, as the records for Industrial policyholders of the Metropolitan Life Insurance Company show. Among white men, firearms continued as the most frequent means throughout the last quarter century, accounting for about one-third of all suicides. Hanging, ranking second, is now used in more than one-quarter of the deaths; asphyxiation by gas follows with nearly one-sixth of the total, and poisoning is in fourth place, far below the others. Among white females, the methods, in order of frequency, are hanging, poisoning, asphyxiation by gas, and firearms. The use of firearms, hanging, and jumping from high places have increased in frequency in recent years. Women are, to an increasing extent, choosing the more violent and disfiguring means of suicide.

15. Is suicide more frequent in urban than in rural areas?

Suicide has always been more common in cities than in the country in the United States and in most of Europe. This finding parallels the fact that mental disease and divorce are also more frequently reported in urban centers than in rural communities. The latest available data, for 1940, show that urban white males had a suicide rate one and one-eighth times that for rural white males. The comparable ratios were one and one-half times for white females, one and three-quarters for nonwhite males, and double for nonwhite females.

16. How important is insanity as a factor in suicide?

A number of prominent physicians and psychiatrists have stated that all suicides are psychotic and that no normal persons, or even those relatively neurotic, actually carry out intentions they may have expressed to do away with themselves. However, other skilled observers are more cautious in discussing the etiology of suicide. In part, this difference is based on the problem of defining what is normal. The absence of a diagnosis of mental illness in the medical history of a person who committed suicide does not rule out the possibility of an unrecognized psychosis.

17. In which season is suicide most common?

There are more suicides in spring and early summer and fewer in winter. This finding holds for both rural and urban areas, and for both North and South. Attempts to explain this phenomenon in terms of cosmic forces or as the result of changes in temperature have proved unconvincing. Suicide is obviously not a reaction to seasonal severity for it has a high incidence in springtime, the pleasantest period of the year.

18. Is the frequency of suicide related to religious affiliation?

The influence of religion helps to explain some of the differences in the suicide rate among nations. Most of the countries with low suicide rates are those in which the Roman Catholic faith predominates. On the other hand, most Protestant countries record high rates. Needless to say there are several exceptions to these generalizations. France, for example, which is mostly Catholic, has a higher suicide mortality than Protestant Sweden; Northern Ireland, with a predominantly Protestant population, has one of the lowest rates of any country. Suicide is rare where the guidance and authority of religion is accepted.

19. What has been the trend of suicide in the United States since 1900?

The overall picture shows practically no change since the turn of the century. The rate for the five-year-period 1944–48, for example, is 11 suicides annually per 100,000 population, and for the five years 1900–04 it was 10.9. However, within this period, the fluctuations in the rate have corresponded to the changes in the economy. The high point during the last half century came in 1932, at the bottom of the depression, when the suicide rate reached 17.4. The low point, 10.0 per 100,000 occurred in 1944, in the midst of World War II.

20. Do economic conditions influence the suicide rate?

The suicide rate tends to rise during hard times and to fall when production and employment are high and also in wartime. The lowest suicide rates of the last half century were found either during or right after wars, while the highest rates occurred during the panics preceding World War I and the depression of the 1930's. The effect of changes in business conditions is particularly noticeable in the fluctuations of the suicide rate among older men.

21. How successful have preventive measures been in controlling suicide?

It is difficult to say how much has been accomplished, for no record is kept of the many activities designed to reduce suicide. There have certainly been benefits from the improvement in our medical services, the increase in the number and effectiveness of our agencies for social work, the increasing interest of religious leaders in mental health, and the improvement in economic conditions generally.

Since the motives behind suicide are complex and varied, a many-sided attack on the problem is called for. The contributions will come principally from teachers, religious leaders, physicians, and psychiatrists. With more attention being given to early evidences of depression and mental illness, there will be fewer who turn to thoughts of self-destruction. All measures for health and social improvement also contribute to reducing the number of suicides.

HOMICIDE

22. What is homicide?

Homicide is a general term used to denote the killing of one human being by another. There are, however, differences in concepts between the meaning of homicide in mortality and in criminal statistics. This is important because mortality statistics supply most of the information on the victims of homicide while criminal statistics are the source of facts about the slayers. Homicide is not always unlawful; it may be excusable or justifiable and therefore within the law, as when an officer of the law, while discharging his duties, kills someone, or when one man kills another in self-defense. Such persons are not regarded as guilty of any crime and are not reported in crime statistics. Mortality statistics list such deaths as homicide. On the other hand, mortality statistics exclude accidental deaths due to criminal negligence, which are classed as homicides in crime statistics.

23. How many homicides occur each year?

More than 8,500 homicides have been reported annually in the mortality statistics records of this country since the close of the war.

The Department of Justice reported 13,010 criminal homicides in 1948, including 7,620 murders or non-negligent manslaughters, and 5,390 manslaughters by negligence. The reason for this difference of about 4,500 homicides between mortality and criminal statistics is discussed in Question 1.

24. What has been the trend in homicide in the United States?

The homicide rate rose quite steadily from 1.2 per 100,000 in the beginning of the century to 9.7 in 1933. From that time until the latter part of World War II, the homicide rate fell gradually to a level of 4.9 per 100,000 in 1944. After the war it again increased slightly, reaching 5.8 per 100,000 population in 1948.

25. How does the homicide rate in the United States compare with that of other countries?

Homicide in the United States ranks high compared with other countries. Prior to World War II, our rate was 15 to 20 times that of The Netherlands, or of England and Wales, and well above that for Finland, which had the highest rate in Europe. Recently, more homicides have been recorded annually in the city of Chicago, alone, than in the entire United Kingdom. Wartime and postwar disturbances were reflected in homicide rates that were higher than normal in many countries of Europe, but Italy and Finland have been the only European countries rivaling our record.

26. Are men more often involved in homicide than women?

The victims in homicide cases are predominantly male. Among white persons, the homicide rate of men in 1948 was three times that of women—4.5 compared with 1.5 per 100,000 population. The ratio is more than four to one among the colored, 49.7 for the men and 11.6 for women.

Men comprise an even larger proportion of slayers. From 1943 to 1948 there were from six to eight times as many men as women arrested each year in the United States for criminal homicide. According to one study, men tend to kill members of their own sex, but the contrary is true for women.

27. How do the homicide rates of the white and colored populations compare?

The homicide rate among the colored is approximately ten times the white rate. In 1948, the rates were 30.2 per 100,000 for the colored and 3.0 for the whites. Among males at ages 15 to 34, the ratio of colored to white homicide rates was more than 15 to 1, but the ratio decreased with advancing age.

Inter-racial homicides form a small proportion of the total. A survey made in certain North Carolina counties revealed that 97 percent of white slayers killed white persons, and 92 percent of Negroes killed Negroes.

28. At what age is homicide most frequent?

Age, as well as color and sex, is an important factor in the frequency of homicide. The highest rates are found in early adult life. At ages under 15, homicide rates are relatively low, and about the same for both sexes. After age 15, however, the rate for white males rises to a high point at about ages 25 to 44, where the frequency of homicide averaged over seven slayings per 100,000 in 1948. Among colored men, the rise in adolescence and early adult life is extremely rapid. The peak rate of 114 per 100,000 was found at ages 25 to 29 in 1948, after which the rates declined. The highest death rate from homicide among white females is in the first year of life (4.8 in 1948) while among colored females the highest rates were recorded from ages 20 to 44.

A similar age pattern in arrests for criminal homicide is reported by the Department of Justice. Based on their reports, the maximum rate of homicide arrests, 12.1 per 100,000, occurred at ages 20 to 24 in 1948 with a gradual decrease in the rate with advancing age.

29. How does the homicide rate vary from state to state?

There are large variations in regional homicide rates. The lowest are found in New England and the highest in the South. The states regularly reporting the highest rates are Alabama, Georgia, Florida, Mississippi, and South Carolina. In these states the rates range from six to 20 times as high as those of some northern ones, such as most of New England, Minnesota, Iowa, Wisconsin, and North and South Dakota.

30. Is homicide more frequent in cities than in rural areas?

Homicide rates, when adjusted for age and color variations in our population, were somewhat higher in small cities of 2,500 to 10,000 persons in 1940 than in larger urban centers or in rural areas. The differences were not great among white persons, but were important among the colored. The homicide rate among the colored in places of 2,500 to 10,000 population was almost double the rural rate, and, in larger cities, 50 percent in excess of the rate for rural areas.

31. Which cities in the United States report the highest homicide rates?

Certain cities in the Southeastern section of the country report phenomenal homicide rates each year. Among them are: Atlanta, Macon, and Savannah in Georgia; Birmingham and Montgomery in Alabama; Chattanooga, Nashville, and Memphis in Tennessee; Jacksonville, Florida; Charlotte, North Carolina; and Norfolk, Virginia. In these cities, homicide ranks among the major causes of death and is responsible for more deaths than most infectious diseases.

32. What are the leading causes of homicide?

A review by the Metropolitan Life Insurance Company of 500 homicides highlights the striking fact that a huge fraction of all killings occur under the stress of emotions. Petty quarrels and disputes are the antecedent condition of half the homicides. Also, in almost half of the 250 killings arising from quarrels, either the slayer, the victim, or both had been drinking.

Jealousy or thwarted love accounted for 17.6 percent of the homicides. In killings motivated by jealousy or thwarted love, the loved one, and not the rival, is the usual victim. Killings arising from or committed during a crime of violence accounted for 16 percent. Among the latter, officers of the law and law-abiding citizens are unfortunately the victims more often than the criminals. Spectacular murders by gangsters constituted a surprisingly low percentage of the total—less than 3 percent. These findings are supported in the main by information from the Department of Justice which indicates that only about 45 percent of those imprisoned for homicide had previous criminal records or had their fingerprints on file. In recent years, the proportion of persons imprisoned for homicide who had previous criminal records has been rising. In 1935, it was only 20 percent.

33. In what season of the year are homicides most frequent?

Conditions vary according to areas, but, in general, the greatest number of homicides is recorded in the summer. The difference between seasons, however, is not great.

34. How frequent is infanticide in our country?

Although the homicide rate of white females is highest in infancy, the slaying of children less than one year of age is now a small factor in the total in the United States. In less than 2 percent of the 8,536 homicides recorded in 1948 were the victims under one year old. The infanticide record of the United States is much more favorable than that of many other countries, including those with low homicide rates. In England, for example, where infanticides constitute a sizable proportion of the total homicides, the death rate is considerably higher than in the United States. In the Orient infanticide has long been relatively common.

35. What are the chief means used in homicides?

Firearms, the principal means of homicide in the United States, are used in nearly three-fifths of all cases. Both sexes among the white and colored have this tendency, but the proportion of killings involving firearms is somewhat higher for males than for females. Knives and other cutting and piercing instruments account for slightly less than one-quarter of all homicides. The use of firearms in committing homicide in this country has become less common in the last quarter of a century. In 1922, three-quarters of all homicides were caused by firearms; by 1948, the proportion was less than three-fifths.

36. Is homicide more common among the foreign-born than among natives in this country?

The Wickersham Commission, after a careful study of the available information, concluded that: "In proportion to their respective numbers, the foreign-born commit considerably fewer crimes than the native-born . . . [but] approach the record of the native white most closely in the commission of crimes involving personal violence." The statistics advanced in proof of that statement showed that the homicide record of native white males is higher than that of foreign-born males.

Confirming this finding are the official government figures of those imprisoned for homicide in state and federal prisons and reformatories. In 1930, the rates of imprisonment for homicide were 4.6 per 100,000 population for native white males 16 years old and over, and 3.0 for foreign-born white males. It is also pertinent that the highest homicide rates among white persons are recorded in those states where the foreign-born are a negligible proportion of the population.

37. What proportion of homicides results in prosecution and punishment of the culprit?

Reports of the Department of Justice for certain cities indicate that arrests are made in more than 80 percent of the cases of murder and non-negligent manslaughter known to the police. Some of the persons apprehended are released for lack of evidence or for other reasons and never brought to trial. There are convictions in somewhat more than one-half of the cases known to police authorities. Some of these convictions, however, are for less serious offenses than charged. Information for 184 cities of 25,000 or more population shows that in 1948, only 42 percent of the defendants were found guilty of the offense charged; the remaining convictions were for less serious crimes.

Of the 1,837 men convicted of murder and admitted to 151 state or federal institutions in 1946—the latest year for which data are available—about 5 percent were sentenced to death, 49 percent to life imprisonment, 23 percent to terms from 20 to 99 years, 14 percent to terms from ten to 19 years, and the remaining 9 percent to less than ten years. Also in 1946, there were 1,497 convicted murderers released from prison. Only 78 of these men had served as many as 20 years, while 93 had been imprisoned for less than two years. The median time served by the whole group was eight and one-third years.

38. How many legal executions are there each year?

In the decade from 1939 to 1948, there was an average of about 130 executions a year. Six states—Maine, Michigan, Minnesota, North Dakota, Rhode Island, and Wisconsin—do not have the death penalty. Georgia had the largest number of executions, followed by North Carolina and New York, each of which averaged about 12 a year. Idaho had no executions, and New Hampshire, South Dakota, and Vermont had only one each during the ten-year period.

Not all of these legal executions were for murder, however. A few states in the South have retained the death penalty for other crimes, such as rape and armed robbery, and occasionally impose it From 1941 through 1948, there were 1,013 legal executions reported in this country; 851 were for murder, 177 for rape, seven for burglary or robbery, six for espionage, one for whom no offense was given, and one life convict was executed for aggravated assault. The six men executed for espionage were German agents and saboteurs who had entered the country during the war and were convicted by a military court; they were executed in 1942.

XVIII

THE LABOR FORCE AND THE HAZARDS OF OCCUPATION

1. How large is our labor force?

The total labor force, broadly defined as those 14 years of age or older with a job or seeking employment, averaged 64.6 million persons in 1950. The labor force is usually at a peak during the summer months because of increased farm employment and jobs sought by school children on vacation. In June, July, and August, 1950 the total labor force was around 66 million. The civilian labor force (total labor force minus the men and women in the armed services) averaged 63.1 million persons during 1950. The table on the following page shows the distribution of the total labor force according to class of worker:

2. How rapidly has the labor force grown in the last 50 years?

The total labor force is at present more than twice as large as 50 years ago. It had only about 29 million persons in 1900 compared with an average of 64.6 million in 1950. The total labor force grew to its all-time record size during World War II when the men and women who entered the military services were replaced in industry by housewives, elderly men, and school-age children. In 1944, the total labor force averaged nearly 66 million. With the end of hostilities, the figure dropped to a little less than 61 million in 1946. Since then, there has been a rise every year. The average civilian labor force of 63.1 million in 1950 was the largest in our country's history.

Class of Workers in the Labor Force in 1950

Class of Workers	Number in Millions (Annual Average)	Percent Distribution
Labor force, total	64.6	100.0
Employed, total	61.5	95.2
Farming or other agricultural pursuits	7.5	11.6
Wage or salary workers	1.7	2.6
Self-employed workers	4.4	6.8
Unpaid family workers	1.4	2.2
Nonagricultural pursuits	54.0	83.6
Wage or salary workers	46.0	71.2
In domestic service	2.0	3.1
Federal, state, and local government	5.8	9.0
Others	38.2	59.1
Self-employed workers	6.1	9.5
Unpaid family workers	0.4	0.6
Military services	1.5	2.3
Unemployed	3.1	4.8

3. What proportion of the labor force is unemployed?

The number of persons unemployed in 1950 averaged about 3.1 million, or 5 percent of the total civilian labor force. In the final months of 1950, however, when we were operating in high gear, the unemployed totaled 2.2 million. The size of the unemployed contingent of the working population has fluctuated within the past two decades between about 25 percent of the labor force in the depression year, 1933, when nearly 13 million persons were out of work, and just a little over 1 percent in 1944, when wartime demands created many local labor shortages and an average of only about 700,000 persons were out of work in the whole country.

4. What proportion of the labor force prefers or is available for only part-time employment?

Among the 62.4 million employed civilians in August 1950, one-eighth worked only part time, i.e. less than 35 hours during the week.

A little more than one-half of these part-time workers were so engaged by preference or because they could not accept full-time jobs.

5. Has the labor force grown in proportion to the nation's population?

In 1950, about 43 percent of the country's population was in the labor force, compared with 37 percent in 1900. Most of the increase is due to a sharp rise in the proportion of women workers. During the past half century, the proportion of the total male population in the labor force fluctuated around 60 percent, but the corresponding proportion for females has risen from 14 to almost 25 percent.

6. How many gainful workers are there on the average in each family?

There is an average of about 1.5 wage earners per family. Almost three-fifths of the families, however, have only one worker. In about two out of every nine couples, both the husband and wife are in the labor force.

7. Do women constitute a growing share of the labor force?

Since 1900, the number of women workers has increased from 5 million, or about 18 percent of the total labor force, to 18.7 million in 1950, or 29 percent of the total labor force. In the war year of 1945, female workers numbered more than 19 million, or 35 percent of the civilian labor force. Although there was a decline after the war, the 1950 figure was greater than that for any prewar year. Many women who joined the labor force to take the places of men in World War II years have remained in it.

8. What restrictions have been placed on the employment of women?

Many states prohibit the employment of women in certain hazardous occupations, place limits on their daily and weekly hours of work in some industries, prohibit their employment for more than six days a week in some fields, and either limit the hours of employment of women at night or allow them no nightwork in certain occupations. Other measures to protect the health of women in industry are concerned with the employment of women before and after childbirth, industrial homework, the lifting of heavy weights, the provision of chairs or stools for women to sit on, rest periods, etc. Employers themselves in some instances have set up restrictions on the employment of women and union contracts sometimes make provision for their protection.

9. How many persons under 18 are in the labor force, and how many over age 65?

In 1950, there was an average of 2.6 million children under the age of 18 years in the civilian labor force, about 4 percent of the total. Nearly 900,000 of these working children were only 14 and 15 years old.

Persons aged 65 years and over in the labor force in 1950 numbered three million, or 4.8 percent of the civilian labor force; there were nearly 2.5 million men and a little less than 600,000 women.

10. What has been the trend in the employment of children and of old persons?

Great gains have been made in controlling the employment of youngsters. The ages at which children were employed and the conditions under which they were exploited in factories, mills, and mines in the early years of the century now seem incredible. It has been estimated that even as late as 1890 children aged ten to 13 made up 7 percent of the labor force. Only a negligible percentage of children of these ages are employed today. It has also been estimated that the average age at which boys entered the labor force in 1900 was about 15; by 1940 it had risen three years to 18. In 1900 about 1.75 million children 10 to 15 years of age, or 18.2 percent of all children of those ages, were reported in the census as "gainfully occupied"; in 1930, the last year for which this information is available, 667,118, or 4.7 percent of the children of those ages were so reported.

The proportion of men over 65 who are still in the labor force has decreased gradually from a little more than three-fifths in 1900 to around two-fifths in recent years. While there has been a growing tendency for older men to retire, it is also possible that the movement from farms, increasing mechanization, and other factors have made it difficult for older men to secure employment in recent years, and that many have, therefore, withdrawn from the labor force.[1]

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[1] See Chapter XV, page 226.

11. What restrictions have been placed on the employment of children?

The states and the federal government have legislated restrictions on the employment of children. In general, the aims are to keep children in school, to limit their working in dangerous occupations, or under conditions or at hours which would injure their health and development.

The Federal Fair Labor Standards Act establishes a minimum age of 16 for most jobs in interstate commerce, of 18 for particularly hazardous jobs, and of 14 for work in a few occupations outside schools hours and with specified safeguards. Work as an actor or performer in the entertainment industry, as a newsboy, and most types of work for the child's own parents or guardians are exempted. The jobs classified as hazardous and in which children may not be hired until they are over 18 include many in explosives and small-arms ammunition plants, in mining, logging, sawmilling, and in industries using radioactive materials. Also considered dangerous are the operation of cold-metal working machines, driving motor vehicles or acting as a driver's helper, and operating elevators, power hoists, or woodworking machinery.

The state laws in general set minimum ages for employment and for leaving school, require work permits for those under age, place limits on the hours of work and on night work, impose additional restrictions on dangerous occupations, and provide special benefits for children who are injured in occupational accidents while illegally employed.

12. Does marital status affect the proportion of men and women who work?

About nine out of ten married men work, but only two out of three single men of the same ages are in the labor force. A relatively large number of the single men are still quite young, and many are still in school.

As one might expect, proportionately far fewer women than men work. One out of every two single women aged 14 and over is in the labor force; one out of every five married women; and two out of five widows or divorcees.

13. At what ages are the most men and the most women in the labor force?

Participation of men in the civilian labor force is at a peak at ages 35 to 44, when 97 percent have jobs or are looking for jobs. About 80 percent of the single women aged 25 to 44 are in the labor force, and more than 25 percent of the married women from ages 35 to 44.

14. Are there more unskilled than semiskilled, skilled, or clerical workers?

Unskilled workers made up the largest single group of labor force members in 1940, totaling 13.5 million persons. Semiskilled workers were second, and proprietors, managers, and officials third. The smallest group was composed of professional and semiprofessional persons.

This breakdown of the labor force according to social-economic status is different for men and women. Clerks, sales personnel, and the like make up the largest group of women workers, within the unskilled group of women, servants predominate.

15. What are the most common occupations of men?

Farmers and farm laborers who have always been the most numerous were still in the lead in 1940, the latest year with detailed occupational data. White-collar jobs—in clerical and sales work—came next. Only the top dozen of the hundreds of distinct occupations listed by the Bureau of the Census are shown below.

Occupation	Number
Farmers (owners and tenants)	5,000,000
Farm laborers (wage and family workers)	3,000,000
Clerks, bookkeepers, and kindred workers	2,500,000
Salesmen, clerks in stores, and kindred workers	2,500,000
Retail and wholesale business proprietors and managers	2,000,000
Chauffeurs, truck drivers, and deliverymen	1,750,000
Machinists and mechanics	1,500,000
Laborers in construction work	1,250,000
Mine operatives and laborers	800,000
Carpenters	750,000
Janitors and porters	550,000
Painters	450,000

16. What are the most common occupations of women?

Clerical, secretarial, and other office jobs are the most common occupations of women; servants and housekeepers rank next in number, as may be seen in the following table for 1940. At that time there were nearly as many teachers as saleswomen and store clerks.

Occupation	Number
Clerks, stenographers, bookkeepers, and kindred workers	2,500,000
Stenographers, typists, and secretaries	1,000,000
Servants and housekeepers in private families	2,000,000
Saleswomen, clerks in stores, and kindred workers	900,000
Teachers	800,000
Operatives in apparel and accessories manufacture	500,000
Waitresses	400,000
Trained and student nurses	375,000

17. Has there been a trend away from unskilled labor?

During the present century, there has been a steady movement from unskilled work into semiskilled and white-collar work. Ordinary laborers, as a group (not counting farm hands), have not only decreased as a proportion of the total working population, but there are actually fewer individuals so occupied today than in 1910. The semiskilled trades and the clerical occupations have both expanded rapidly. Even the category of proprietors, managers, and officials (excluding farmers and farm managers) has increased both absolutely and in proportion to the size of the labor force. The number of skilled workers or craftsmen and foremen has roughly kept pace with the growth of the labor force.

18. How great has been the decline in the proportion of workers engaged as farmers and farm workers?

In 1870, about seven million persons—more than half of the gainful workers in the country—were in agriculture. Since then, there has been a progressive decline in the proportion engaged in farming, until by 1910 it was less than a third of all workers. At present only about eight million—approximately one-eighth of the labor force—are employed in agriculture. During the last eight decades, the number of farmers and farm hands has gone up by only one-seventh, but the total working population of the country has increased to almost five times its former size.

19. How rapidly have the professional classes grown?

There has been a great expansion in the professional classes in the last 80 years, especially among women. Today there are approximately 2.7 million men in professional and semiprofessional work, and 1.7 million women. (Semiprofessional work includes such occupations as aircraft flying, surveying, acting, photography, etc.) The proportion of men in the professional classes in the male labor force has risen from less than one-fortieth in 1870 to about one-sixteenth today. Many fields have become numerically important only in the last few decades. In 1870 there were fewer than 8,000 chemists, metallurgists, and engineers; there are now about 40 times as many.

Among women workers, the professional classes have always made up a larger proportion than among men, growing from one-twentieth of the female labor force in 1870 to about one-ninth at present. Teachers and nurses together number around three-quarters of all professional women, but there are also many types of professional work into which women have only recently gone. The whole field of social work, for example, is largely a development of the present century. Eighty years ago there was only a handful of women doctors, lawyers, reporters, and editors; these groups now total in the thousands.

20. How do the occupations rank according to income level?

Professional workers, on the whole, do best of all, according to data compiled for 1949 by the Bureau of the Census. Not only was the median income [2] of professional workers the highest for male workers, but it was about one and a half times that of operatives and kindred workers (roughly the semiskilled), who make up the largest single nonagricultural occupation group. The table on page 280 shows the median income and percentage of workers in each group with incomes

[2] One-half earned less and one-half earned more than the "median" income.

of more than $6,000. Craftsmen and foremen have a comparatively high median income, well above that for all employed civilian males. The farm groups rank at the bottom of the list, but the money income of farmers is not strictly comparable to that of other workers. Farm families normally have a good deal of nonmoney income; farm owners usually raise a large share of their own food, and farm hands are usually given their room and board.

Income Level for Various Civilian Male Occupation Groups, Counting Total Money Income Received in 1949

Occupation	Median Income for Persons with Income	Percent with $6,000 or over
All employed civilians	$2,634	5.1
Professional workers	3,985	23.0
Proprietors, managers, and officials	3,556	19.4
Craftsmen, foremen, etc.	3,114	2.5
Clerical and kindred workers	3,060	2.6
Semiprofessional workers	3,030	4.6
Salesmen	2,775	5.0
Operatives and kindred workers	2,605	0.3
Service workers (excluding domestics)	2,065	0.6
Laborers (other than farm and mine)	2,025	0.4
Farmers, farm managers	1,027	4.2
Farm laborers and foremen	781	—

21. How do the income levels of men and women compare?

Judging by the figures for 1949 shown on page 281, not only is the median income of women workers below that of men, but women usually earn a great deal less than men in the same field. The median income was $2,634 for all employed civilian males in 1949, while the figure for women came to only $1,522. The proportion of women earning above $6,000 a year was largest for the occupation group consisting of proprietors, managers, and officials; there the figure was only 2.0 percent compared with 19.4 percent for men.

Occupation	Median Income	
	Men	Women
All employed civilians	$2,634	$1,522
Professional workers	3,985	2,271
Proprietors, managers, officials	3,556	1,926
Clerical and kindred workers	3,000	2,023
Sales	2,775	1,115
Operatives and kindred workers	2,605	1,539
Service workers (excluding domestics)	2,065	997

22. How many years may a worker expect to remain in the labor force?

With mortality conditions and labor force participation existing in 1940, it has been estimated that a workingman aged 20 might expect to spend another 41.1 years in the labor force, and a man of 40, another 23.7 years.

23. How do some occupations affect health?

The effects of occupations on health are both direct and indirect. Specific hazards, such as exposure to accidents and to dust, directly influence the morbidity and mortality of workers in many jobs. The environment produced by small earnings in certain kinds of work, particularly unskilled labor, may also contribute to ill health and curtailed longevity. Low pay imposes a relatively low standard of living which may be marked by inadequate food and clothing, crowded and unsanitary living quarters, the need to stay on the job when ill, and other handicaps to health. Mortality studies show that the death rate for workers and their wives increases as the economic scale is descended.

24. What are the common occupational hazards?

Industrial accidents take the largest toll, killing annually about 15,000 and causing nearly two million nonfatal injuries. Dusts take fewer lives, but are a serious hazard in a number of industries. Not all industrial dusts are dangerous, but silica and asbestos particles are especially damaging to lung tissue.

Among the industrial poisons which are most common are carbon monoxide, benzol, and compounds of lead, mercury, chromium, and arsenic. New substances are continually being brought into use in industry, and many of them may be dangerous. The introduction of a large number of volatile solvents has increased the list of industrial poisons considerably. Beryllium compounds have also been found to cause severe lung affections and a high mortality from cancer of the lung has been reported among men employed in the chromate-producing industry.

Dermatitis due to contact with acids, alkalis, or other irritant substances is a frequent cause of disability. Overexposure to X-rays, radium, the radioactivity associated with nuclear fission, as well as to ultraviolet and infrared rays is also a potential hazard.

Aside from the specific hazards mentioned above, many jobs involve such potentially harmful conditions as excessive heat, sudden variations in temperature, dampness, compressed air, decreased atmospheric pressure, poor illumination, long-continued repetitive motion, constant pressure on a part of the body, or repeated shocks.

25. What occupations have the highest total mortality?

The very highest recorded mortality rates among the common occupations are found where there is a combination of a high probability of accidents and exposure to dusts which contain a very large percentage of free silica. This situation is found in some hard-rock mining, such as gold, silver, copper, and especially lead and zinc mining. American insurance company studies indicate that the mortality in these occupations is more than three times that of white-collar workers.

26. What occupation groups have the lowest total mortality?

Among the occupation groups with low mortality are farmers, professional and clerical workers, and business proprietors and officials. Clergymen, notably Anglican clergymen, have one of the lowest death rates.[3]

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[3] See answer to Question 30 of Chapter XXIV, page 400.

27. What occupations have the highest mortality from tuberculosis?

Among workers who are exposed to large quantities of silica dust, the tuberculosis mortality rate is from six to more than ten times the average for men employed in nonhazardous occupations. Metal miners, granite cutters, chippers of metal, sandblasters, sandstone wheel grinders, and anthracite coal miners have high death rates from tuberculosis. In addition, comparatively high mortality rates from tuberculosis occur among unskilled workers not exposed to any particular occupational hazards; this poor record is largely a reflection of their economic position.

28. What is silicosis and how is it related to tuberculosis?

Silicosis is a disease of the lungs caused by breathing air containing large amounts of very fine free silica dust (silicon dioxide). In the lungs, silica produces nodules which have a characteristic appearance on the X-ray film. Another effect of silica is to stimulate tubercle infection; severe cases of silicosis often terminate in tuberculosis. Silica is found pure, as quartz, in many rocks and sands. A silicosis hazard is present in occupations concerned with mining; quarrying, rock crushing, grinding, or drilling; stonecutting; and other industrial work where silica dust is generated.

29. What occupations have the highest mortality from pneumonia?

The death rate from pneumonia is highest among unskilled workers and lowest among professional workers, business proprietors, and officials. Clerks, farmers, and skilled workers also have below average mortality from pneumonia. Apart from the social-economic influences affecting the death rate from this cause, workers appear to be made more susceptible to pneumonia where there are specific occupational hazards such as fatigue from strenuous labor, inhalation of irritating gases and dust, heat accompanied by sudden variations in temperature, and exposure to inclement weather. Mortality from pneumonia is high among welders, iron and steel foundry and mill workers, underground metal miners, anthracite coal miners, metal buffers and polishers, and among the proprietors of drinking establishments and bartenders.

30. What occupations have the highest mortality from cancer?

Cancer mortality increases as the social-economic scale is descended from the highest to the lowest class. Specific occupational cancers have also been recognized, among which are the scrotal cancers of chimney sweeps and mule spinners, cancer of the fingers and hands of radiologists, osteogenic sarcoma of radium dial painters, cancer of the skin of oil and paraffin workers, cancer of nasal sinuses and lungs of nickel refinery workers, lung cancer of chromate workers, and cancer of the bladder of dye workers.[4]

31. How common are the occupational skin diseases?

Occupational skin diseases are more common than all other types of occupational disease combined. About 1 percent of the industrial workers in the country, it has been estimated, are annually affected by occupational dermatoses, and in some fields the incidence is as high as one out of every 13 workers. In a Public Health Service survey of 12 different industries, it was found that the synthetic resin and chemical and dye industries had the highest frequency of occupational skin disease. In general, the most common causes of such complaints in industry are petroleum products and greases. This is not because they are the most powerful skin irritants but because more workers are exposed to their action than to any other class of irritant chemicals. Next in frequency as causes of skin difficulties are the alkalis, solvents, plants and woods, and the materials used in metal plating.

32. Do many occupations leave noticeable marks or signs on workers?

The number of occupational signs or marks is considerable. Although such distinguishing marks were once more common than they now are, the development of industrial medicine and safety engineering has by no means eliminated them entirely. The physical signs of work may range all the way from superficial callouses or skin irritations to alteration of both appearance and personality. A few examples are: callouses on the back of the left little finger among stone cutters (from holding the chisel in a particular way) and on the center of the shins among house painters (from leaning against ladder rungs). The fingertips on the left hands of bricklayers are often so abraded that fingerprinting is almost impossible. Workers exposed to certain chemicals used in munitions manufacturing occasionally have their skin discolored yellow or orange. A peculiar leaning, accelerating way of walking known as "rooster gait" may be the result of manganese poisoning, and an exaggerated high-stepping gait may come from lead or arsenic poisoning. Mercury poisoning, once not infrequent among felt hat workers, may even lead to extreme shyness and timidity.

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[4] See answers to Questions 17, 18, and 19 of Chapter IX, pages 135 and 136.

33. What occupations have the highest mortality from accidents?

Data relating to fatal accidents while at work are limited to broad industrial groups and therefore conceal the very high rates for certain individual occupations. The highest death rate recorded is for the extractive industries—mining, quarrying, and the oil and gas well industries. As a group, workers in these fields have an occupational accident death rate five times that of workers in general. Very high rates are recorded also for the construction workers, more than three times the average; agricultural workers, about twice the average; and transportation workers, about one and two-thirds times the average.

Life insurance studies of general mortality show a very high total accident death rate, occupational and nonoccupational combined, for building wreckers, electric light and power linemen, fishermen, longshoremen, lumbermen, miners, motorcycle policemen, oil and gas field rig builders and handlers of explosives, railroad brakemen, structural iron workers, and window cleaners.

Other occupations known to be hazardous but for which no figures are available include diving, automobile racing, steeple-jacking, and stunt flying.

34. How many days do workers lose because of sickness and accidents?

It has been estimated that, on the average, a worker is disabled for nine calendar days annually by sickness or accidents.

Many workers escape accidents and disease altogether; others have more than their share. In one group of men studied for a year, there were about as many cases of disabling sickness or injury of one day or longer as there were workers, but all the disabilities occurred among about three-fifths of the men. More than a quarter were sick or injured two or more times. In a survey of a number of companies, the average duration of absences because of illness or nonoccupational accidents lasting at least eight days was 36 days.

35. What are the chief causes of lost time due to illness in industry?

A study of absences from illness or injury lasting one day or longer among a group of public utility workers shows that respiratory diseases, of which the most common were colds and influenza, caused more than half of the absences and about one-third of the days of disability; the experience was the same for both male and female workers. Next in importance as a cause of lost time were digestive diseases, principally diseases of the stomach (not counting cancer), and appendicitis; injuries were third. A combined group of rheumatic diseases, including rheumatism, diseases of organs of movement (except joints), neuralgia, neuritis, and sciatica made up the fourth-ranking class.

36. Do women lose more time than men because of sickness disability?

Lost time from sickness and accidents disabling for one day or longer averages nearly 12 calendar days annually for female workers compared with about eight days for male workers. Women workers are absent on the average about twice as often as males, but lose less time per absence.

37. Do older workers lose more time than younger workers?

The best information available shows a tendency for the frequency of one-day or longer absences because of sickness or injury to decrease with age. The annual number of days lost per person for medical reasons, however, increases sharply with age.

38. Do physically impaired workers lose more time because of illness than other workers?

Limited information available in one study of manufacturing plant workers indicates that the number of days lost because of illness was only slightly greater among the physically impaired as a whole than among unimpaired workers subject to the same job incentives and exposed to the same hazards. Persons with hernias or with arrested tuberculosis did not lose any more time from work because of illness than unimpaired workers. Those with vision and hearing defects lost less time. Workers with serious orthopedic or cardiac defects, peptic ulcer, diabetes, and epilepsy lost somewhat more time than the unimpaired workers. On the whole, however, the number of days lost was low—a fact which tends to lessen the importance of the differences between impaired and unimpaired workers in the days lost from work because of illness.[5]

39. Do the physically handicapped find a place in the labor force?

Organized efforts on the part of government, business and industry, unions and various health services have added several million handicapped persons to the labor force. An indication of what is being done to rehabilitate the handicapped and find them jobs is to be found in the services provided by the Office of Vocational Rehabilitation of the Federal Security Agency, which works with many state agencies for the handicapped. These services include individual counseling and guidance; medical, surgical, psychiatric, and hospital care; the provision of prosthetic devices and the training necessary for their use; supplying occupational tools; job placement and follow-up after placement. In the seven-year period ending June, 1950, 335,000 disabled men and women were completely rehabilitated through the program of the Office of Vocational Rehabilitation.

40. To what extent has the work week been shortened in the last 35 years?

The average scheduled work week of wage earners in manufacturing plants is estimated to have been around 55 hours in 1914, in contrast to the 40-hour week of today.

41. To what extent are workers protected against loss of income due to occupational injury by workmen's compensation laws?

Every state has a workmen's compensation law designed to provide for income, medical care, and other services to persons accidentally injured at work regardless of who was at fault in the accident. Provision is also made to pay compensation to dependents of workers killed in industrial accidents. Within recent years the trend has been to extend this protection to diseases attributable to the hazards of the

[5] See answer to Question 39 of Chapter XVI, page 254.

occupation. The premiums on workmen's compensation insurance are paid by the employer.

Not all groups of workers, however, are included under the various state laws. It has been estimated that not more than 50 to 60 percent of the gainfully employed are actually protected by state workmen's compensation. The largest group usually excluded is in agriculture. Others also usually left out are domestic servants, casual workers, and employees of charitable institutions. In some states, employers may choose not to operate under the act if they prefer to risk an injured worker's suit for damages. Some states limit the coverage to certain "hazardous" employments and some exempt employers having fewer than a specified number of employees.

Federal compensation laws cover government employees, longshoremen and harbor workers, private employees in the District of Columbia, railroad employees in interstate commerce, and seamen.

42. To what extent are workers assured an income in old age under The Social Security Act? [6]

43. To what extent are workers assured of an income when unemployed?

All 48 states and the District of Columbia have unemployment insurance. Persons who qualify under the law and who are unemployed through no fault of their own are referred to suitable jobs, or, if none are available, paid weekly benefits for a limited time. Unemployment insurance is operated by the states in cooperation with the U. S. Department of Labor. In general, most workers in private industry and commerce are covered. Excluded are federal government employees and in most states agricultural workers, state and municipal workers, domestic workers, workers in religious, charitable, and certain other nonprofit organizations, casual laborers, and railroad workers, who are covered by the federal Railroad Unemployment Insurance Act. In many states only persons in establishments employing eight or more during 20 weeks in a year are covered; in other states, firms having one or more employees are covered. Except in Alabama and New Jersey, workers make no contributions to the unemployment insurance fund. The average weekly benefit in the year ending June 30, 1950, was $20.86.

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[6] See answer to Question 16 of Chapter XV, page 231.

44. To what extent are disabled workers assured of an income under voluntary health and accident plans?

Well over half of the labor force is guaranteed against loss of income from disability by voluntary insurance and plans.[7] The following table, in which adjustments have been made to account for persons protected under more than one system, gives the estimated number covered by the various forms of voluntary protection at the beginning of 1950:

All forms, total	34,436,000
Group and individual insurance	21,666 000
Paid sick leave—in private industry	4,560,000
—in civilian government service	4,750,000
Employee Mutual Benefit Associations	1,460,000
Union plans and other employer-employee methods	2,000,000

45. To what extent do states help to provide benefits for nonoccupational illness?

Four states, Rhode Island, California, New Jersey, and New York, have inaugurated compulsory plans of insurance to provide cash benefits to workers absent from work because of nonoccupational sickness and injury. Normally there is a waiting period of seven days before employees are entitled to these benefits. Maximum benefits in New York and New Jersey are $26 a week, in Rhode Island $25, and beginning January 1, 1952, in California $30. The California plan provides an additional $8 daily benefit for the first 12 days of hospital confinement. Weekly benefits are payable for 13 weeks in New York and for 26 weeks in the other three states. Certain types of employment are excluded from participation in the program. In general, although the provisions in this regard are not entirely uniform, the principal employments not covered include agriculture, domestic service, work for certain nonprofit organizations, railroad transportation, and government.[8]

[7] See answer to uestion 46 of Chapter VI, page 93.

[8] See answer to Question 48 of Chapter VI, page 94.

46. Can persons in hazardous occupations get life insurance?

Life insurance companies have developed special insurance at somewhat higher than standard premiums for persons unable to meet the regular requirements because of impaired health or hazardous work. In January, 1949, Americans had four and one-quarter million "extra rate" ordinary life policies for a total of 8.5 billion dollars.

Persons in especially safe work, such as white-collar jobs, can get special low-cost policies with some companies, provided they can meet the health and other requirements.

47. Are group life and group accident and health insurance available only to employed persons, and how many workers have it?

Group insurance, which is unusually low in cost is written only on a company or on a special group, not on an individual basis. The group must have at least a certain number of employees, and a minimum percentage of them must apply for coverage in order to get group insurance. At the beginning of 1950, well over 17 million workers in this country were insured under group life policies. About ten and one-quarter million were covered by group accident and health insurance, and more than six and two-thirds million by group accidental death and dismemberment policies.

XIX

HUMAN IMPAIRMENTS

1. How may impaired persons be classified?

The classification may be on the extent and nature of the deviation of physical or mental health from the normal state, or in terms of working capacity. Thus departures from a normal state of health may result in either temporary or permanent disability, and each of these forms may be either a total or partial disability. Impairments may range all the way from such minor conditions as nearsightedness, hay fever, or loss of a finger, to severe crippling, blindness, or advanced chronic disease.

2. How many impaired persons are there in the United States?

By the broadest standard, most people would be considered impaired. Thus, Selective Service examinations of men of military age, when physical capacity should be at its peak, showed relatively few individuals entirely free from impairment. In the National Health Survey of 1935–36, about one-sixth of all persons were found to have a chronic disease or impairment, but many of these conditions did not interfere seriously with working capacity. If the same ratio exists today, this country has over 25,000,000 chronically ill or impaired persons. Approximately 12 persons per 1,000 were disabled during the entire year prior to their enumeration in the National Health Survey. Again, on the assumption that this finding applies to our present population, not far from 2,000,000 men and women are chronic invalids.

3. How does the incidence of chronic disease or impairment vary with sex and age?

Chronic disease or impairment, like sickness, is reported more frequently among women than among men. On the other hand, permanent disability because of disease or impairment is about the same among women and men at ages 20 to 34; it is actually lower among women at ages 35 to 64.

The frequency of impairments and of chronic invalidism increases steadily with advancing age, the rise being particularly rapid among older persons. Thus, about one-quarter of those at ages 35 to 54 had some chronic disease or impairment in the National Health Survey; at ages 75 and over, the ratio was one-half.

4. What are the principal impairments?

The National Health Survey showed that the rheumatic diseases ranked far ahead of all other chronic conditions as a cause of impairment. Next in order were heart disease, arteriosclerosis and high blood pressure, and hay fever and asthma. These were followed by orthopedic defects, hernia, and hemorrhoids. Still lower on the list of impairments were chronic bronchitis, impaired hearing, kidney diseases, and nervous and mental diseases.

According to recent estimates, this country has more than 7,000,000 cases of rheumatism and 5,000,000 cases of heart disease. Well over 500,000 people are undergoing treatment for cancer at any given time. The number of known diabetics in the country has been placed at 1,000,000, with a like number of undiscovered cases.

5. How do the various impairments rank as causes of disability?

In terms of disability lasting for a week or longer, first rank is held by respiratory diseases. This is followed in turn by the communicable diseases of childhood, accidents, and diseases of the cardiovascular-renal system. In terms of permanent disability, however, first rank is held by nervous and mental diseases, followed by rheumatism, diseases of the heart, tuberculosis, high blood pressure and arteriosclerosis, and diabetes. It should be noted that in studies of the type of the National Health Survey, on which these findings are based, certain diseases are seriously understated, as for example, tuberculosis, venereal disease, and mental disorders.

6. How do the various diseases or impairments differ in importance among men and women, and according to age?

Among young men, orthopedic impairments rank highest in frequency, followed in order by rheumatic diseases, hay fever, hernia, and cardiovascular-renal conditions; among older men the highest ranking causes are rheumatic diseases, orthopedic impairments, cardiovascular-renal conditions, hernia, and hemorrhoids.

Among both younger and older women, the first two ranking causes are rheumatic diseases and cardiovascular-renal conditions. The next highest ranking conditions in young women are hay fever, goiter, and diseases of the genital organs; and among older women, varicose veins, hemorrhoids, and deafness.

7. What are the chief defects disclosed by periodic health examinations?

Data on periodic health examinations relate primarily to persons who are going about their daily tasks in apparently good health. Consequently, these data cannot be expected to show any large proportion of currently serious or disabling defects, but chiefly conditions or habits which are likely to be harmful in the long run. Among types of defects found in great frequency in these examinations are defects of vision (either uncorrected or insufficiently corrected), elevated blood pressure, hemorrhoids, and dental and mouth conditions, such as carious teeth, septic roots, gum infections, and pyorrhea. However, even among these apparently healthy people some serious conditions are occasionally found for the first time on periodic health examination. While no single disease or condition of major import is found in large numbers, the aggregate with significant adverse findings is sizable.

8. How do the findings from periodic health examinations differ among men and women and according to age?

Most defects show an increased frequency with advancing age. This is particularly marked for hypertension and other cardiovascular impairments, urinary impairments, overweight, dental and mouth conditions, and hemorrhoids. On the other hand, the prevalence of upper respiratory disorders and defects and of goiter is greater in young adults than in older persons.

The principal conditions which show a markedly higher prevalence among women than men are goiter, digestive complaints, varicose veins, hemorrhoids, and defective vision. Men have the higher rates for cardiovascular impairments, dental and mouth conditions, and defective hearing.

9. How is the frequency of various impairments related to body build?

Most of the serious defects are found with greater frequency among overweights than among average or lighter weight persons. On the other hand, tuberculosis, anemia, and thyroid disease are the most important conditions which are more frequent among underweights. However, differences in the reported frequency of defects according to build are not always easy to assess, since the examiner may have difficulty in determining the presence of certain types of defects among overweights. An excellent example of this is arterial thickening. This is detected less frequently in overweights than in persons of lighter build because the method used, palpation of the arteries, is likely to give an inaccurate result in stout persons.

10. What do the records of life insurance companies show regarding the prevalence of impairments?

Life insurance companies record only those defects that are likely to cause some reduction from average longevity. Nevertheless, the facts are of especial interest because applicants for life insurance are presumably healthy and able to go about their daily affairs. A recent survey of a number of insurance companies showed that only three out of 100 applicants had such defects or were in such occupations that they were unacceptable as risks. About another nine of the 100 were such risks that they could be accepted only for extra rate insurance. In recent years the proportion of persons ineligible for standard insurance and the proportion rejected for any insurance has perceptibly declined.

11. Which of the impairments are the most frequent causes of rejection for life insurance?

Almost one-half of the applicants ineligible for any insurance were declined because of some cardiovascular-renal condition. Not quite one-third were rejected because of other medical impairments disclosed by examination of the applicant or by his medical history. A very small proportion were ineligible for insurance because of extreme overweight or underweight. Likewise, relatively few were rejected because of the hazards of their occupation.

Among those granted insurance at extra rates, about one-seventh were either overweight or underweight, and approximately one-fifth had some cardiovascular-renal condition. Other poor medical histories and physical findings together accounted for about one-fifth of those charged higher than standard premiums. In over one-third of the cases, the extra charge was because of occupational hazards.

12. What did the examinations of draftees in World War II show as to the prevalence of impairments?

Most men examined for Selective Service showed some defect, but the findings were influenced by the extent of the examination, which varied, and by the amount of detail that appeared in the records. Of those examined before Pearl Harbor, 72 percent had defects; but in a wartime sample, 63 percent were recorded as having defects. In the peacetime sample, those with defects averaged 1.9 per registrant. Even of the men accepted for general military service, 43 percent showed one or more defects. The most frequent defects reported were flat feet, eye defects (chiefly refractive errors of vision), missing or carious teeth, pyorrhea, diseased or enlarged tonsils, varicocele, hernia, and minor skin disorders.

13. What proportion of the draftees in World War II were rejected for military service?

Of all the men examined for military service through Selective Service up to the end of the war, 30.2 percent were rejected. The proportion rejected varied widely within the country. New Jersey, Nevada, Kansas, and Iowa had rates somewhat less than 25 percent. Georgia, North Carolina, and South Carolina had rates above 40 percent. In general, the best record was found in sections of the East, Middle West, and Pacific Coast, and the poorest in the South and Southwest. These gross findings, however, must be interpreted with caution because they are influenced to a great extent by the varying proportion of rejections for failure to meet minimum educational standards. Unfortunately, there are no good data relating specifically to medical causes of rejection. Rejection rates were also subject to a number of other influences. Thus, they were lowest among young men and highest among older draftees, reaching a figure of nearly 50 percent for those over 38.

14. What were the most important causes of rejection for draftees in World War II?

Mental disease (chiefly psychoneurosis) and mental deficiency (chiefly inability to meet minimum intelligence or educational standards) were the leading causes of rejection. Of the physical defects, first place was held by musculoskeletal defects such as absence or deformity of any part of the body due to accident or disease; and next in importance were cardiovascular defects, including heart disease, high blood pressure, and related disorders. Other frequent causes of rejection were hernia, syphilis, neurological defects, bad eyes, and ear defects.

The frequency as well as the causes of rejection for military service during World War II were greatly influenced by the requirements, both physical and mental, for effective service in modern warfare. They were also influenced by the pressure of manpower needs, the standards used, the varying quality of the examinations, and the detail in which the conditions were recorded. Consequently, Selective Service statistics concerning impairments or rejections cannot be accepted at their face value as definitive measures of the prevalence of serious impairments or as proof of widespread deficiencies in national health; they are, rather, indicative of the existence of conditions that vary widely in their import and in their potentiality or need for correction.

15. What differences were found between draftees of the first and second World Wars?

A number of factors make it difficult to compare rejection rates for the two World Wars. These are differences in the age composition of the men called for service, examination standards, techniques of the examining physicians, and the improved medical facilities available in World War II, such as the use of chest X-rays. Moreover, in 1917–18 all men were given physical examinations before classification for deferment, but in World War II physical examinations were given only to those who had no reasons for deferment.

In general, the principal causes of rejection were much the same in the two wars, particularly when allowance is made for the various factors involved. However, for many leading causes the proportion of men rejected was smaller in World War II. Cardiovascular and musculoskeletal defects, for example, each of which accounted for a little over 14 percent of all rejections in World War I, were responsible for only 8 and 7 percent respectively in World War II. There was also a decrease in rheumatic heart disease. On the other hand, hypertension was more frequently a cause of rejection in World War II. Two factors contributed to this situation—first blood pressures were taken routinely in World War II but not in World War I, and second, a higher proportion of older men was examined in World War II. Tuberculosis showed a great decline, from 8 percent to 3 percent. This decrease is the more remarkable because for a greater part of the time chest X-rays were taken routinely in World War II, whereas this was exceptional in World War I. "Flat feet," another major cause of rejections in World War I, was not important in World War II. Rejections for mental disease, on the other hand, were many times higher in the second World War than in the first. One reason for the greater number of rejections for psychoneurotic disorders was that these conditions had been found to constitute a very important cause of disability in the armed forces, and consequently a concerted effort was made to screen out such cases in World War II.

16. What are the chief defects disclosed by school health examinations?

Nation-wide data regarding the prevalence of defects in school children are not available because the type and quality of school health examinations vary widely over the country. Recent data for Philadelphia school children are perhaps the best available as a result of Pennsylvania legislation which requires complete medical and dental examination of pupils every two years. In medical examinations of nearly 100,000 pupils in that city in 1945–46, a little over 20 percent were found to be free of defects. This percentage overstates the case somewhat because it includes children with dental defects which were missed by medical examination but were picked up later by dental examination. Tooth defects, chiefly caries, were most frequent, being found in nearly 80 percent of the children. Other leading defects were malnutrition (15 percent), diseased tonsils (13.8 percent), defective vision (12.7 percent), flat feet (11.2 percent), and poor posture (10.9 percent). Skin diseases were surprisingly frequent (noncontagious, 3.2 percent; pediculosis, 2.2 percent; and ringworm, 1.2 percent). Of the more serious conditions, most frequently reported were heart disease (total, 2.7 percent; organic, 1.6 percent; and functional, 1.1 percent); defective hearing, 1.1 percent; defective speech, 0.9 percent; abnormal nervousness, 0.9 percent; and spinal curvature, 0.8 percent.

Wartime examination of junior and high school students in Cincinnati disclosed 408 physical defects per 1,000 examined. One or more dental defects were present in 84 percent of the students. Slightly over 6 percent had impairment of vision, and 2 percent impairment of hearing. Organic heart disease was reported in 1.7 percent, about one-half of these cases being of rheumatic origin.

A comparison of records among up-State New York children for 1925-26 and 1945–46 showed few significant changes in the frequency of defects which could not be explained by changes in the type of the examination or the method of recording. The most significant changes were decreases in faulty nutrition, diseased tonsils, and thyroid abnormalities.[1]

17. What is the effect of underweight and overweight on mortality?

Insurance studies have shown that those who are below average weight for their age have a higher mortality up to about age 30 or 35; in men, it is about one-fifth above that for average weight. After that age, underweights do better than those of heavier build, and increasingly so with advancing age. At the younger adult ages, the lowest mortality is found among persons of average weight. Overweight of more than a slight degree is a disadvantage at any age, and the mortality increases steadily with degree of overweight. In comparison with persons of average weight or less, the mortality rate among overweights is increasingly unfavorable with advancing age. Thus, among men past 50, the death rate of those 25 percent or more overweight is more than one and one-half times that of men 15 percent underweight. Consequently, the weight that is average or normal for the individual at about age 30, taking sex and type of build into consideration, should be maintained in later adult life

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[1] See answers to Questions 25, 26, 38, 39, and 40 of Chapter XIV, pages 218 and 223.

18. Which major conditions show increased mortality in underweight and overweight persons?

Tuberculosis, pneumonia, and respiratory diseases generally account for the major part of the excess mortality of young underweights. On the other hand, diabetes, degenerative diseases of the heart and arteries, nephritis, and gallstones account for the higher mortality among overweights. Overweights are generally poorer risks for surgery than persons of lighter build. Even cancer, accidents, and suicides show higher rates for overweights than for average or underweights. Among older obese persons the death rate for pneumonia also is above average. In addition, maternal mortality appears to be higher among stout women than among those who are average or thin.

19. What effect has medical progress had on the relative mortality of underweights and overweights?

As a result of the sharp reduction in the death rates from tuberculosis and pneumonia in recent decades, especially at the younger ages, these diseases account for a much smaller proportion of the total death rate than ever before. This reduction favors particularly the underweights who are more susceptible to these diseases than are heavier persons. Consequently, the downward trend in the total death rate has been fastest in underweights. This has improved their standing relative to those of heavier build. In fact, it may no longer be the case that underweight is a disadvantage in young adult life. Certainly, from the long-term point of view, underweight is conducive to long life once the age of maturity is reached.

20. What are the principal reasons for making urine tests?

Routine tests of the urine are most commonly made to determine the presence of undue amounts of albumin, sugar, pus, blood, and casts. At the same time the specific gravity of the urine may be determined. These urine tests can be made quickly and cheaply and, therefore, can be repeated as necessary. They serve a variety of uses, although in themselves they do not give sufficient information for diagnosis.

21. What is the significance of findings in urine tests?

Sugar in the urine, if significant in amount and persistent, is usually indicative of diabetes. In fact, many physicians teach diabetic patients how to test their urine for sugar to indicate how well their disease is kept under control. In some rare instances where sugar may be found in the urine regularly, it is due to a minor defect in kidney function. This condition, known as renal glycosuria, has little or no effect at all on health and longevity. Nowadays when sugar is present in successive urine specimens of a patient, a blood sugar test is made. A high blood sugar with glycosuria is usually a positive indication of the presence of diabetes. Albumin, casts, and blood, if found in the urine persistently in significant amounts, and with persistent low specific gravity, are indicative of either kidney or urinary tract disease or a disturbance in kidney function due to other conditions. Pus in the urine may be due to infection of the urinary tract or elsewhere.

Insurance studies of persons with small amounts of albumin show a significant increase in mortality, particularly among older persons with persistent albuminuria. The mortality is highest for overweight persons with this abnormality. Among those with casts only, mortality is not increased, but those with albumin and casts found together in the same specimen have a death rate significantly in excess of normal.

22. What are the prospects for persons with pulmonary tuberculosis? [2]

23. What effect does pleurisy have on longevity?

The significance of pleurisy varies greatly according to its cause, duration, and the age and weight of the patient. Many people use the term rather loosely to describe a chest pain of some severity which lasts for just a short time, but attacks of this kind are usually not due to pleurisy and may be of little significance. Sometimes pleurisy is a complication of an acute disease like pneumonia. In many cases it is also due to tuberculosis; this is particularly true of so-called wet pleurisy. Often, however, the cause of the disease is not determined. Life insurance investigations of persons with a history of pleurisy, the cause of which is not known, show them to have an appreciably higher mortality than average. Among those with dry pleurisy, the death rate was found to be about one and one-half times the average, and for those with wet pleurisy it was somewhat higher. The record was especially poor for young underweights and persons with attacks of long duration. Tuberculosis and pneumonia were the principal diseases responsible for the excess mortality.

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[2] See answer to Question 27 of Chapter VIII, page 123.

24. What effect does bronchitis have on longevity?

Mild degrees of bronchitis are of little significance, but chronic bronchitis is attended with considerable extra mortality. The mortality is particularly high among underweights, but it is also excessive among overweights. The extra mortality is due to high death rates from pneumonia and heart disease.

25. What are the prospects for persons with various types of allergy?

Allergies vary greatly in nature and severity. Hay fever, which is the most common, causes a great deal of temporary disability and discomfort but is without any effect on longevity so long as it does not develop into true asthma. In like manner, most of the other common allergies, such as eczema, have little or no effect on the duration of life, however troublesome they may be. Asthma, however, does affect longevity. Studies of insured persons with a history of the disease show a significant increase in the death rate. The mortality is especially high among those who had a recent attack. Build is a factor in the outlook, the highest mortality being found among underweights and the next highest among those who were overweight. The record for cases complicated with chronic or severe bronchitis was particularly poor. Respiratory diseases, particularly pneumonia, account for the major part of the increased death rate among asthmatics, but there is also a significant excess in mortality from heart disease among them.

26. How does diabetes affect longevity?

Although the outlook for diabetics has improved greatly and steadily with successive advancements in the treatment of the disease, the longevity of diabetics is still below the average for nondiabetics.

The experience of patients of the George F. Baker Clinic, who are probably better than average diabetics, shows a reduction of about one-fourth to one-third in their length of life compared with the general population. For example, the expectation of life of the diabetic child of ten is estimated at 44 years, as against 59 years in the general population. At age 40 the expectation for the diabetic is 22 years as against 31 for the general population. The chief reasons for the poorer longevity of diabetics are the high death rates from heart disease and nephritis. Specific hazards to diabetics directly related to their disease are diabetic coma, insulin reactions, and diabetic gangrene. However, modern methods for the control of the disease have reduced these hazards to relatively small proportions.[3]

27. What is the effect of thyroid disease on longevity?

The most common form of thyroid disease is simple enlargement, which is rather prevalent in certain geographic areas. The areas principally affected in this country are around the Great Lakes and in certain inland mountain areas. It has been found that this type of goiter is due to iodine deficiency. The use of iodized salt has brought a reduction in the frequency of the condition, and it is now of much less importance than formerly. Thyroid enlargement is also particularly common in young women, but this is in great part a normal physiological process and not an abnormality.

For the most part, simple thyroid enlargement of slight degree has no effect on longevity. Other types of thyroid disease and simple enlargements of greater extent are potentially more harmful, but fortunately surgical correction is easily made in these conditions. More serious are hyperthyroidism or so-called toxic goiter or thyroid tumors, some of which are cancerous, and which sometimes also are accompanied by hyperthyroidism. Uncorrected, these conditions can eventually be fatal, but toxic goiter and benign tumors of the thyroid can be cured by operation. Mortality studies of persons operated on for these conditions show that the mortality among them is no higher than average. Much can also be accomplished for cancer of the thyroid. As a result of atomic research, radioactive substances have been developed which appear to be helpful against this condition.[4]

[3] See Chapter X, page 144.

[4] See answer to Question 38 of Chapter XXI, page 343.

28. What is the effect of anemia on longevity?

Simple anemia is in many respects much less a problem today because of the rapid increase in knowledge of nutrition. Persons with simple anemia have shown no marked increase in mortality due directly to the condition, but they appear to have a reduced efficiency and activity, and more illness because of their susceptibility to certain diseases. Of far greater seriousness is pernicious anemia in which the disturbance is due to a lack of substances necessary to the production of red blood cells. Such a substance was discovered in liver by Doctors Minot and Murphy, for which they were awarded the Nobel Prize in Medicine in 1934. Prior to that time the average duration of life after diagnosis of pernicious anemia was only two and one-half years. Today many persons with pernicious anemia who adhere to a prescribed medical regimen are able to carry on their customary pursuits and usually live long enough to succumb to another cause. However, longevity in the presence of this disease is reduced appreciably.

29. What is the mortality of persons with kidney stones?

Renal colic is a relatively frequent condition, but despite the great pain and distress it causes, it is rarely fatal. However, in some of the more severe and chronic cases, the condition requires relief through surgery, and among them the death rate is somewhat higher than average. Insured persons with a history of this condition but without operation have an approximately average mortality. The chief risk in this condition is the damage to the kidney; consequently, mortality from chronic nephritis is substantially increased among persons who have had renal colic. Fortunately, the nature of this condition is better understood today, and its frequency is declining.

30. What is the mortality among persons who have had a kidney removed?

Persons who have had a kidney removed and are otherwise in good condition show some increase in mortality over average, particularly in the early years after operation. Subsequently the excess mortality decreases. The degree of excess mortality is, however, not very large; even for cases with a recent history, the death rate is less than twice the average. Chronic kidney disease is the chief contributing factor to the excess mortality in these cases. This reflects the inability of the remaining kidney to carry the burden, particularly if it is overtaxed or if there is a recurrence of the condition for which one kidney was removed. The reasons for removal of the kidney vary, most important being tuberculosis of the kidney or damage to the kidney resulting from stones in the kidney or in the urinary passages.

31. What are the prospects for persons with gall bladder diseases?

Early and proper care of diseases of the gall bladder bring relief, and in such cases there is no impairment of longevity. Gallstones and inflammation of the gall bladder, which often occur in combination, are relatively common conditions. In fact, so frequently are they found at autopsy that it is obvious that the number of persons who show symptoms and receive treatment is only a fraction of the total affected. The condition is reported about six times as frequently in women as in men. Overweights are particularly prone to gall bladder disease. Many patients get well with medical treatment alone, but delay in operation for those where it is indicated may result in serious complications and premature death. The longevity record for those who have had the gall bladder removed because of gallstones or inflammation is excellent. Where there was only drainage of the gall bladder, the results are less favorable, but this difference may be attributed in part to the severity of the condition or to complications at time of operation which make it the procedure of choice. In general, the outlook is distinctly better for women than for men.

32. What is the mortality among persons with ulcer of the stomach or duodenum?

The outlook for persons with ulcer varies greatly according to the location of the ulcer and according to various individual characteristics of the patients. The frequency of ulcers in the duodenum, the portion of the intestine next to the stomach, is far greater than those in the stomach itself. Men are far more susceptible to the disease than women. These conditions are essentially chronic in nature and are characterized by more or less frequent acute recurrences which, however, may be prevented. The special hazards in these conditions are hemorrhage and perforation of the ulcer with resulting peritonitis.

Most cases can be handled successfully with medical treatment alone. While the treatment calls for strict diet, modern medical management is greatly concerned with personal and emotional factors which apparently play an important part in the development and course of the disease. In many cases it is necessary to operate. The mortality among those who have been operated on for duodenal ulcer is somewhat above average, and higher than for unoperated cases. The record is poorer for those with a history of operation for gastric ulcer. In part, this reflects the complications of the disease, and in part the chronic nature of the ailment and the failure to correct the basic causes. The degree of excess mortality varies inversely with the time elapsed since operation or last attack. Among cases with a recent history or operation, the mortality is twice the average; among those free of symptoms for many years it is virtually average or only slightly elevated, depending upon the time elapsed.

Mortality from cancer of the digestive tract is very high among persons with a history of stomach ulcer. In some of these cases it is likely that the original diagnosis was at fault.[5]

33. What is the mortality among persons who have had venereal diseases?

Gonorrhea apparently is without any significant effect on the duration of life, although it causes temporary disability and is a factor in the sterility of women. Syphilis, on the other hand, if untreated, frequently brings serious complications that greatly shorten life and may cause serious disability. This is due to the late complications of the disease such as syphilis of the heart and circulatory system. The peak of the death rate from such complications occurs between 40 and 50 years of age. The central nervous system is also the site of serious late complications. These often result in gross mental deterioration. Most of these cases have to be hospitalized and account for a high proportion of the total number of persons in hospitals for mental disease.

Proper treatment of early syphilis generally prevents these complications, and the mortality among such persons is not much higher than average. The use of penicillin has greatly improved the outlook in syphilis, with regard to both the prevention and treatment of late complications of the disease. However, penicillin has not been in use long enough to permit accurate assessment of the results or even to be certain of what the ultimate effect will be on the frequency of late complications, but there is good reason to be optimistic. While patients with late complications benefit from the new methods of treatment, the deterioration of the central nervous system in advanced syphilis can rarely be corrected.[6]

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[5] See answer to Question 47 of Chapter XXI, page 346.

34. How many cripples are there in this country?

The number of persons with lost or crippled limbs is estimated at approximately 2,500,000. Males account for more than 70 percent of the total. Only a relatively small part of the total number of cripples are incapacitated because of their deformity, although many are disabled for other reasons. The total number incapacitated because of crippling is about 350,000, and about 60 percent of them are males. These persons constitute about one out of every eight male cripples and one out of five female cripples. The prevalence rate of crippling, whether disabling or nondisabling, increases steadily with age, but the percentage with incapacitating impairments is highest in childhood and old age. The occurrence of new cases rises with age among males. Among females there is a decrease from childhood up to the middle 30's and thereafter a rapid rise with age.

35. What are the major causes of crippling?

Among males, approximately 70 percent of the crippling is due to accidents or other violence, but among females only little over 40 percent is due to these causes. Among cases incapacitated by crippling however, diseases are the major factor, accounting for about 55 percent in the males and 70 percent in the females. Occupational accidents overshadow all other accidental causes among males, but among females home accidents lead. Automobile accidents are the cause of about 6 percent of crippling among men and 5 percent among women. Of the diseases, apoplexy is the leading cause, both among men and women, particularly among those incapacitated by crippling, where it accounts for more than one-third of the total cases among men and more than two-fifths of incapacity among women. Infantile paralysis accounts for 5 percent of the male cripples and 10 percent among females. Congenital causes and rheumatism are other leading causes of crippling.

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[6] See answers to Questions 9, 10, 11, 14, and 15 of Chapter XXI, pages 333–336

Among males, slightly less than half the crippling involves loss of members or limbs, but among females, only about one-sixth are of this type. Among those not disabled, the proportion with lost members is somewhat higher in both sexes. Among those incapacitated, however, crippling or paralysis predominates, accounting for about 90 percent of the cases among males, and 96 percent among females. The absence of one or more fingers accounts for about two-thirds of the cases with lost members. Only about a fifth have lost a foot, leg, hand, or arm, and the number with two or more major members missing is very small indeed.

36. What effect does crippling have on longevity?

The longevity of cripples varies greatly according to the type, severity, and cause of the condition. Thus, the loss of toes, fingers, hands, or feet can be expected to have little if any effect on longevity. Even persons who have suffered major amputations as a result of accidents are not seriously affected in this respect. In fact, life insurance studies of men thus impaired have shown a relatively small increase in mortality over the average. In like manner, crippling resulting from infantile paralysis generally brings little or no impairment of longevity. The mortality experience of persons with spinal curvature is also generally favorable. However, the outlook is not as good for severe cases, particularly those due to tuberculosis, because of recurrence of that disease. Crippling due to stroke has a relatively poor prognosis because of the underlying and usually major impairment of the heart and arteries. This is true also for those who have suffered amputation for diabetic gangrene because these diabetics generally have serious impairment of the heart and blood vessels. In the experience of one clinic, the average duration of life after operation in these cases is about three years.

37. How many blind persons are there in the United States?

The number of blind persons today probably exceeds 260,000. Approximately 55 percent of the blind are males. The difference in the incidence (new cases) and prevalence (existing cases) of blindness between males and females is greatest in childhood and in the working ages, chiefly because of the greater frequency of blindness due to accidental causes in males. More than three-fourths of the blind are over 45 years of age, and about one-half are 65 and over.

38. What are the chief causes and types of blindness?

In a high proportion of cases the cause of blindness is unknown or not determined. Infectious diseases are implicated in a significant proportion of the cases, the most important of these diseases being syphilis and trachoma. Fortunately, blindness due to these conditions is decreasing. Sizable numbers of the blind are born so or become blind in infancy as a result of congenital causes or infection. Cases of the latter, particularly from gonorrhea, are much rarer than before because of the great improvement in measures to prevent blindness in the new born as well as to the reduction in the incidence of congenital syphilis.

Accidents account for approximately one-tenth of the cases of blindness. This cause is most important at the working ages, although the majority of these accidents are nonoccupational in origin. Glaucoma and cataracts are also important causes of blindness in adults.

39. What is the mortality among the blind?

The mortality of blind persons is greatly affected by the type and cause of the condition as well as age. Those whose condition is not due to disease and who live under suitable conditions have a relatively favorable record. Insurance experience with carefully selected cases of this type has been relatively satisfactory, showing a mortality only one and one-half times the average. However, as a group, the blind suffer a high mortality. The most comprehensive study of this kind shows that their death rate was two and one-half times average. Mortality of the blind was 20 times the average among children under ten, and 35 times average at ages ten to 14. After that age, the ratio decreased rapidly; after 70 it was less than twice the average. The high mortality at the younger ages is due to the frequency of malignant tumors of the brain as a cause of blindness; in these cases the deaths are usually due to the tumor.

Mortality among the blind is particularly high from such diseases as syphilis, cerebral hemorrhage, diabetes, arteriosclerosis, and kidney disease. In large part, the excess mortality from these causes is due to the existence of these conditions at the onset of blindness, and often they are actually the cause of it. Other diseases in which the death rates of the blind are distinctly above average are heart disease and pneumonia. Mortality from accidents, while above the average, does not show as great an excess as other causes. This is due to a markedly reduced exposure to accidents as a result of the sheltered and restricted environment in which blind persons live.

40. How does the incidence of defective teeth rank among the physical impairments?

Among children, defective teeth rank ahead of all other impairments. Almost everyone has had an experience with a decayed, missing, or filled tooth before early adolescence. At age 18, the average white person has 30 serviceable teeth. It is estimated that for the average white adult one tooth is extracted or indicated for extraction every two and one-half years of adult life. Females generally have a higher prevalence of defective teeth than males.

41. How comprehensive is the program of official and voluntary agencies in the rehabilitation of handicapped persons?

Specific but generally small-scale projects in behalf of various groups of the handicapped have been in operation for a long time. A great stimulus to measures for rehabilitating handicapped persons was provided by the need for workers in World War II and by the desire to rehabilitate the war veterans who became disabled by disease or injury while in the service. Consequently, this problem is being given greater attention than ever before. At present, the most comprehensive effort is the joint federal-state program administered by the Office of Vocational Rehabilitation in the Federal Security Agency. This program, according to which the federal government gives financial support to the states for their work, now operates in all the states, the District of Columbia, Hawaii, and Puerto Rico. The program combines all the necessary services to prepare the disabled person for a job which utilizes his best skills and his full capacities, and to secure his placement in such a job. These services include not only counselling and guidance but also medical and surgical care needed for rehabilitation, artificial appliances, job training, and if necessary, the occupational tools and equipment. In the fiscal year

1950, over 59,500 cases completed their rehabilitation during the year and were at work. An additional 12,000 had been placed in employment but too recently to determine whether their rehabilitation had been completed, and still another 13,000 were ready for placement. In the seven years from 1944 to 1950, altogether 335,000 disabled persons completed rehabilitation under this program.

In addition to those rehabilitated under the federal-state program, there are sizable but undetermined numbers who are served by private agencies and the Veterans Administration. However, the available facilities are far short of the needs, for it is estimated that there are between 1,500,000 and 2,000,000 men and women of working age so severely disabled that they cannot support themselves or their families. Moreover, each year about 250,000 men and women become disabled by chronic illness, congenital defects, and accidents, who would benefit from rehabilitation services.

XX

MENTAL HEALTH

1. What is mental health?

Mental health has been defined as "the ability to face problems and make choices, to find satisfaction and happiness in the accomplishment of daily tasks, to work efficiently and to live effectively with others." It is much more than the mere absence of disease and defect; it is a positive state of mental integration, efficiency, and happiness that enables one to adapt to the environment, to have a feeling of confidence and security, to understand oneself and be capable of love and enjoying life. This is a large order; it is a goal rather than a norm. Just as there are relatively few who do not have some slight physical defects—perhaps poor teeth, or imperfect eyesight, or a weak joint which is favored a little-- so there are few individuals who do not also have some form of emotional disturbance.

The universality of emotional or mental disorders means that mental health and mental hygiene problems are probably the most widespread of all health problems. It is only recently that their importance has been recognized, and they are still far from completely understood.

2. What are mental deficiency and mental disease?

Mental deficiency, a subnormal state of development of some or all mental functions, results from some constitutional defect of the brain or nervous system. It may be inherited, congenital, or acquired through injury or disease; it is essentially incurable and unremediable, except as treatment and training form habits by which the mental defective, under favorable circumstances, may compensate to some extent for his limitations. Even at his highest stage of development he reveals his deficiency through his immaturity and social incompetence.

Idiots, the lowest grade of mental defectives, are unable to do anything for themselves and cannot be taught even the simplest rules of hygiene and cleanliness. The next grade of mental defective, the imbecile, can be taught simple routine tasks, particularly of a manual nature. Morons have a mental capacity reaching to the borderline of low normal intelligence. They are fundamentally incapable of the achievements of the normal mind since they are defective in reasoning and judgment and live by habit. With some guidance they are, however, often able to manage their affairs and get along fairly well if situations are not too complicated. Because of their lack of self-control and judgment, many become social problems. These deficiencies, together with their susceptibility to suggestion, may make them dangerous tools of more intelligent criminals.

Mental disease is a category of illness which prevents effective use of a person's mental and emotional equipment. It is independent of intellectual capacity. Even a genius may have so narrow or distorted a view of reality that he cannot get along. Then he is mentally sick. Mental disease may be caused by "physical" or by psychological disorders. It is a product of the interaction of an individual's constitutional makeup with his total environment and experience.

The intellect is not the only part of personality involved in mental illness. The emotions and intellectual processes are so closely bound up that, as psychology and psychiatry progress, it becomes increasingly difficult to separate the two. Mental disease is disease of the whole person, not just disease of the thinking apparatus.

3. What are the more common forms of mental disease?

There are two general types of mental disease distinguished by the degree of the individual's awareness of the world around him. Persons suffering from neuroses are usually in fairly good touch with their environment, although they may have a somewhat warped view of it, whereas those suffering from psychoses tend to live in worlds of their own.

The neuroses are more frequent than the psychoses. It is even probable that no person is entirely free from neurosis, a category that includes the phobias, obsessions, complexes, hysterias, and anxieties. Despite the universality of neuroses, they are seldom severe enough to require placing a person in an institution. Less than one-twelfth of the first admissions to mental hospitals in this country are so-called "psychoneurotics."

The psychoses, on the other hand, although not always more serious than the neuroses, more often require institutional rather than other types of care. The most common of all psychoses is schizophrenia or dementia praecox, a disease usually marked by retreat from reality and sometimes by obvious scattered personality. One-fifth of all first admissions to mental hospitals are schizophrenics. The psychoses of old age, technically called senile psychosis and psychosis with cerebral arteriosclerosis, are together responsible for almost as many first admissions as schizophrenia. Alcoholic psychosis and alcoholism account for about one-tenth of the first admissions; manic-depressive psychosis for about one-twelfth; involutional psychosis—a depression of late middle age—about one-twentieth.

Paresis, the mental degeneration caused by syphilis, was once a relatively frequent form of insanity, but is now the diagnosis in only about one-twenty-fifth of the new cases entering mental hospitals. The convulsive disorders, including epilepsy, account for only about one-fiftieth. There are a number of other mental diseases, but they are relatively rare. A few, like paranoia, have been publicized out of proportion to their frequency.

4. How prevalent is mental disease?

About one out of every eight men examined for the draft in World War II was rejected because of personality or mental difficulties. Currently, about one in every 20 persons spends part of his life in an institution for mental patients. One percent of the total population is incapacitated on any given day by mental illness or mental deficiency or by complaints arising from mental disorders. More than half of the hospital beds in the country are occupied by mental patients.

Careful checks in the Eastern Health District of Baltimore and in Williamson County in Tennessee brought to light a mental disorder case rate between 60 and 70 per 1,000 persons. When an even more detailed survey was made in three selected areas, the rate was almost doubled.

All this adds up to somewhere between eight and one-half and 15 million Americans who either are now suffering from some form of mental difficulty or will be at some time in their lives.

5. Is mental illness increasing in this country?

There is no evidence that mental illness is more prevalent in any given age group today than fifty or a hundred years ago, but it is true that a greater proportion of the total population is now hospitalized for mental disease. Since the turn of the century the rate of hospitalization for mental illness has more than doubled. This is the result of a growing awareness of the problems of mental health, of increasing urbanization of the nation, of the gradual aging of the population, and, most important of all, of the marked increase in mental health facilities. The rate of first admissions to mental hospitals rises rapidly with age,[1] and an increasing proportion of the population is in the old age group. For generations some writers and doctors have been claiming that mental disease was on the increase, even on an age-for-age basis. The statistics do not seem to bear this out. Before the Civil War and in what is considered the relatively stable Victorian age, many people were saying the pace of "modern" life was causing proportionately more and more crack-ups. Actually, the only field in which there is any sign of a true rise in mental disease is in the psychoses associated with alcoholism. At the same time, there has been a decline in paresis.

6. How does this country compare with others in regard to mental health?

The United States has one of the highest rates of hospitalization for mental disease in the world, but this is not a cause for alarm. It means that this country at least realizes that the mentally disordered need help. How the United States compares with other nations in incidence or prevalence of mental disease no one can tell, as international figures on a comparable basis are not available. Outside of North America, Western Europe, and the British Commonwealth, relatively little is done about mental disease.

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[1] See answer to Question 9 of this Chapter.

7. Are there relatively more mental patients in some sections of the country than others?

New England and the Middle Atlantic States have the highest rates of hospitalization for mental disease and deficiency, and the South Central States the lowest. New York, with 605 resident mental patients per 100,000 population in 1946, had proportionately almost three times as many as Utah, the lowest state. These rates of hospitalization have a tendency to increase or decrease with the degree of urbanization of the states. Even within a state the relative number of mental patients from cities was usually much higher than from rural areas. The excess of mental patients from cities is explained partly by the fact that doctors and clinics are usually concentrated there. The crowded conditions of living in urban sections also make home care there, for the mentally diseased, difficult if not impractical. In all probability there is little real difference between cities and the country in the frequency of mental disease.

8. Is mental illness especially prevalent among certain racial, religious, and nativity groups?

There apparently are such differences, but there is no proof that they reflect differences in susceptibility. It is not a question of inherent weakness but rather of the kinds of lives various groups live, whether by choice or by force of circumstances. Minority groups in communities often exhibit somewhat higher rates of hospitalization for mental illness than the majority groups. A racial or religious group may have a high frequency of mental disease in one place and not in another. In many sections of the country the rates for Negroes are much higher than for whites, although in some Southern surveys mental disease was found more frequently among the whites.

The foreign-born have often shown more mental illness than the general average. Native children of the foreign-born do better on that score than their parents, but not so well as second or third generation natives.

9. Is mental disease more common in old age?

Mental disease is much more common among the old than among those at other periods of life, but it is not true that all mental diseases increase in incidence with age. Senile psychosis and psychosis from cerebral arteriosclerosis are by nature primarily diseases of later life. On the other hand, schizophrenia, the most common form of functional psychosis (as distinguished from psychosis having organic cause), has its peak of onset in early adult life. Manic-depressive psychosis may come on at almost any age, but particularly between 20 and 60. The highest rate of first admissions to mental hospitals is among the old. Practically no young children are hospitalized for mental illness. This does not mean that children are immune to mental disease, but rather that the diseases are usually not diagnosed until later, and also that young children are normally more easily treated and can frequently be cared for without hospitalization.

10. Are there significant differences in the recorded incidence of mental disease by sex and marital status?

At every age, men have higher rates of first admission to mental hospitals than women. Some of the difference in rates by sex may arise from a greater reluctance to commit women than men to mental hospitals.

Marriage is so fundamental a part of normal living that it would be strange if the degree of marital success were not connected with emotional balance and with mental health. Marital status is a current indication of a person's mental health as well as a factor in future changes. As might be expected, the married have the best mental health record, and the divorced have the worst. In between come the widowed and the single; the widowed on the whole do somewhat better in regard to mental health than the single.

11. Is mental illness more common among the poor than the well-to-do?

Mental disease, like so many physical diseases, is brought about by the interaction of individuals and their environment. The environment includes all the surroundings, not only physical but also psychological. It includes the comfortable situations which money can arrange and the frustrating ones which poverty brings. In addition to creating circumstances particularly suitable for breeding mental illness, poverty may also be a symptom of emotional or mental disorder already present.

By far the largest proportion of state hospital patients comes from poor homes, where outside financial aid is required, or from families just barely able to support themselves. However, since state hospitals are free, a slight bias in the direction of those unable to afford private care may have crept into studies of state hospital patients. Other investigations indicated the same social and economic trend in mental disease. The poorer communities had more mental disease. Within cities, the prevalence of mental illness decreases from the crowded center toward the residential suburbs.

12. Does mental illness run in families?

Current opinion is that mental disease is not directly inherited, but that some predisposing factor can be passed on. Parents with a mental disorder are more likely than others to have mentally ill children, probably because the home in which the children are raised is conducive to its development. Even mild mental disorders resulting in family disruption may have bad effects on the mental health of children. The incidence of mental illness among the children of the mentally ill is many times higher than in the general population. It has also been suggested on the basis of studies of mental disease in twins that there may be an inheritable predisposing factor in some kinds of mental illness.

13. Do "physical" health problems contribute to mental illness?

Mental disease can be caused by "physical" illness, particularly if the brain is directly affected. The psychoses of old age and of cerebral arteriosclerosis and paresis are examples. Serious nutritional deficiencies and metabolic disturbances may also affect mental health. A starvation diet is likely to make persons who were previously quite friendly abnormally suspicious and antagonistic. It is a commonplace that patients with chronic physical difficulties are likely to be chronically irritable as well. Almost any serious illness is sure to affect the mental outlook of the patient. Illness in which the chances of cure are small or in which the hospitalization is likely to be prolonged have an especially serious impact. Tuberculosis patients, for example, require special guidance because of the severe and long-term disruption of their lives.

14. Does mental disease contribute to other health problems?

The sharp division between mental and "physical" health problems has almost disappeared. Estimates of the importance of mental health in the so-called "physical" disorders vary, but Dr. William C. Menninger of the Menninger Clinic, psychiatric consultant to the Armed Forces during the war, suggests that between 35 and 70 percent of the persons consulting physicians do so because of mental disorders known or unknown. Almost half of all the patients going to gastroenterologists (specialists in stomach and intestinal troubles) have no organic stomach or intestinal disorders, but display symptoms which are essentially the result of emotional difficulties.

15. How many patients are there in mental institutions in the United States?

There are more than 800,000 patients who are treated in the country's approximately 950 mental hospitals and institutions during the course of a year. The population of mental institutions has been growing by about 2 percent a year.

16. How many psychiatrists and other technical personnel are there in the field of mental hygiene?

There are almost 6,000 psychiatrists in the country. For those working in mental hospitals the case load averages almost 300 patients per doctor. There are only about 8,500 psychiatric nurses working in mental hospitals and there are about 1,200 clinical psychologists and about 1,600 psychiatric social workers. These trained men and women work in about 950 mental hospitals and institutions, more than 600 psychiatric clinics, and the various voluntary agencies serving in mental hygiene. This is the field force to deal with mental health problems affecting a minimum of 8,500,000 citizens.

17. How great is the unfilled need for trained psychiatric personnel?

The level of care for mental patients in many areas is incredibly low. The average case load of 300 patients per psychiatrist for mental hospitals (from 30 to 150 is recommended, depending on the type of service) means that the majority of patients cannot possibly be effectively treated. As a result, years of life are wasted. There is a need for at least four times as many psychiatrists as there are in the country, to make a total of over 20,000. Although more than half of all hospitalized patients are mental cases, less than one-fortieth of all registered nurses were in psychiatric service in 1950. The shortage of clinical psychologists is equally serious. It was estimated recently that there was a need for at least 10,000 more clinical psychologists. Psychiatric social workers are also in great demand and short supply. In 1950, there were 1,586 members in their association, whereas 15,000 are needed to satisfy the standard of one to every 10,000 persons which the American Psychiatric Association recommends.

18. How many more mental hospitals and clinics are needed?

An expansion of the mental hospital system by about 80 percent is needed to approach the proportion of five beds for mental patients for every 1,000 persons in the population. There are at present about 380,000 acceptable beds, not counting those for mental defectives or epileptics, and another 300,000 are necessary. The present overcrowding in mental institutions is almost universal; mental hospitals average about one-sixth more patients than their rated capacity and in some states they have 50 percent more patients than they were built to care for.

The shortage of clinics, which can do a great deal of preventive work and help to relieve the load on hospitals, is even more acute. In some states there are no psychiatric clinics. More than 600 full or part-time community clinics exist in the country as a whole, whereas there should be at least 1,800 full-time clinics, according to the recommendation of the National Health Assembly.

Psychiatric services for schools, colleges, universities, and for courts and prisons are pitifully few. The problem is twofold: many of these institutions are not yet aware of the valuable use they could make of psychiatric personnel in preventing mental illness; second, many of those which are conscious of this cannot find trained persons to do the work. In 1948, about 30 courts and 15 colleges and universities had made provision for regular psychiatric consultation.

19. How does care for the mentally ill vary from region to region?

In expenditures per mental patient, the Middle Atlantic states lead, followed by the Mountain states and the East North Central region.

The Southern states spend the least on their mental patients. In the number of staff members per patient, the Mountain, Middle Atlantic, and New England states lead, and the Southern, West North Central, and Pacific states trail.[2]

20. How much does mental illness cost the country annually?

The cost of maintaining more than half a million patients in public mental hospitals, excluding federal institutions, was more than 300 million dollars in 1948. That, however, is only the beginning. The federal mental hospitals—most of them veterans hospitals—spend many millions more on mental (neuropsychiatric) patients. No figures are available for the cost of private care, the loss in income because of mental illness, the cost of accidents or of crime resulting from mental disorder. Without question, the annual bill for mental illness runs into the billions.

21. Do the patients in public mental institutions receive adequate care?

The average daily expenditure for mental patients in public hospitals, except those of the federal government, was about $1.80 per individual in 1948. Only about 40 cents a day per person was spent for food. The expenditure of hundreds of millions of dollars each year on hospitalized mental patients buys them only the minimum in facilities and food, and purchases very little in the way of psychiatric treatment. Hospitalization for mental illness too often means merely custodial care.

22. Is mental disease curable?

A great many types are, but not all. As yet, there is no cure for senile or cerebral arteriosclerotic psychosis. Likewise, by the time a patient develops paresis, his syphilis has gone so far that the chances of cure are not good. Most of the functional psychoses, however, can be cured, but the proportion which are actually cured is relatively small. In part this is the result of a deficiency in funds for treatment and personnel. Also, some cures require prolonged and intensive care, which is not available for large groups of patients. The neuroses are on the whole much more curable. Even such relatively severe forms as hysterical paralysis can often be treated successfully.

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[2] See answer to Question 7 of this Chapter, page 315.

23. What are the methods of treatment and for what kinds of mental disease are they used?

Aside from the medical and surgical treatments for mental illness having primarily "physical" origin, there are a number of essentially psychological or psychiatric treatments for mental illness. Psychotherapy ranges from suggestive and supportive treatment, in the form of reassuring and explanatory talks, through hypnosis and psychoanalysis. Psychoanalysis is the most intensive and longest type of treatment, often requiring two or more years. Other forms of therapy include the use of drugs to relax the patient and help remove his inhibitions during sessions with the psychiatrist, and group psychotherapy, in which a number of patients meet with the psychiatrist at one time.

Perhaps the most publicized of the recent developments in psychiatric treatment has been the use of shock—electrically or drug-induced – in manic-depressive and involutional psychosis and in schizophrenia. The shock treatments, usually used in conjunction with psychotherapy, have often been highly successful, cure rates in some studies being as high as 33 percent and improvement rates, including cures, sometimes coming to about 80 percent.

Another dramatic form of treatment is an operation known as a prefrontal lobotomy, in which certain lobes are disconnected from the rest of the brain. This procedure is usually employed only in severe cases of mental disease, and is still in an experimental stage.

24. How much could be saved in cost of care by more widespread use of therapy already available?

About 30,000 patients a year are now hospitalized for schizophrenia (dementia praecox). If all received intensive shock treatment, the cost would be offset by the cures obtained and the consequent reduction in the number of remaining patients. The use of shock therapy on all suitable patients might decrease the annual bill for hospitalization by many millions and at the same time restore to normal living thousands of persons still in the active period of life.

25. What is the average duration of hospital stay of mental patients?

Those who are hospitalized for mental illness remain in institutions for an average of about four years. Schizophrenia patients spend, on the whole, the longest time in hospitals. Their average stay is eight years, and two-fifths of them remain more than ten years. This is because the onset of the disease is usually fairly early in adult life and so few cases are being cured. Alcoholics, manic-depressives and those with involutional psychosis have an average hospitalization time of about three years; this period, relatively short for mental patients, reflects the much higher recovery rate in these diseases. Patients with paresis and senile dementia are likely to be hospitalized for around two years and those with psychosis with cerebral arteriosclerosis for about two and one-half years. The hospital stay of persons with these conditions usually ends in death rather than discharge.

26. Are most discharged mental hospital patients readmitted later?

One-quarter of all persons admitted to New York State mental hospitals in a year are former patients; about six-tenths of the manic-depressives and more than a third of the schizophrenics admitted in a year are former patients. Even in cases where the patient is able to remain outside the hospital, he may not be fully cured. In some areas, where there are relatively few facilities for mental care, there is a conscious effort made to discharge patients after a short stay in order to give someone else an opportunity to use the limited hospital space.

Preparation of the home to which a patient is to return is very important in helping the mentally ill to complete their recovery or at least retain what improvement they have made in the hospital. Too often the interpersonal problems in the home which have contributed to the mental illness in the first place may still be present when the patient returns. In one study of two groups of discharged patients, among those whose return home had been prepared by intensive social work, 83 percent were able to remain outside of the hospital for more than six months; of the others, for whom no special preparation had been made, only 40 percent stayed out of the hospital for more than six months.

27. How do death rates among mental patients compare with those of the general population?

Although mental disease is seldom, if ever, a direct cause of death, the mentally ill have much higher death rates than the general population. In 1948, the death rate for patients in New York State mental hospitals was more than seven times as high as for the state as a whole. The largest difference in mortality was at ages 20 to 24, when the rate for mental patients was more than ten times that of the general population at these ages. With increasing age the differential declined until at 75 and over, the death rate for those in mental hospitals was two and one-half times that for all old people in the state.

In the organic mental diseases, such as paresis and psychosis with cerebral arteriosclerosis, the excess of deaths among mental patients was especially great; but even in the functional psychoses, such as manic-depressive psychosis and schizophrenia, the death rates, on an age-for-age basis, are generally much higher among mental hospital patients than among the general population.

28. Is alcoholism a mental disease and can it be cured?

Many cases of alcoholism are due to mental illness. Alcoholism and alcoholic psychosis are responsible for about 10 percent of the first admissions to mental hospitals.

There are a number of supposed cures for alcoholism and alcoholic psychosis. Usually, however, these symptomatic cures are not fully successful unless accompanied by psychotherapy. Although the proportion of alcoholics discharged from mental hospitals is high, many of the cures are not permanent. In New York, the number of alcoholics readmitted is about half the number discharged in a given year.

29. How prevalent is alcoholism, and is it increasing?

It is estimated that there are more than 4,000,000 chronic excessive drinkers in the country. Alcoholism is much more prevalent today than a quarter century ago. From the turn of the century until the enactment of Prohibition, there was a steady decline in the rate of hospitalization for alcoholic mental disease. Right after Prohibition came into effect the decline was accelerated, but it was soon followed by a steady rise in the rate. The peak was reached in 1941. During World War II the rate fell again, only to start up once more after its end.

In the past few years health authorities in many states have realized that alcoholism is a medical problem. Today 39 states and the District of Columbia have set up facilities for medical care and rehabilitation of alcoholics and for research into the problem.

30. Are most criminals insane and can criminality be cured?

Legally, criminals are not insane until ruled so either by a court trial or by court-appointed psychiatrists. The word "insane" refers to a state defined by law; it is not a medical term. Only a small proportion of criminals are either legally insane or actually psychotic, probably from 3 to 8 percent. Mental deficiency and other serious abnormalities, including psychopathic personality, account for probably no more than a quarter of the criminals, but most of the others can be considered as maladjusted and mentally disordered to some degree.

The conflicts and disorders which result in criminal behavior are so often deep-seated and ingrained that cure is ordinarily exceedingly difficult. In most parts of the country no attempt is made to give criminals psychiatric treatment.[3]

31. How widespread is criminality and delinquency?

Crimes reported in the country in 1949 numbered about 1.8 million. The prison population of the country is over 165,000 (excluding local jails), and the number of children in schools for delinquents is about one-fifth as great. The number of prisoners in the country was increasing before the war but from 1940 until 1945 the trend was reversed; since then the prison population has been rising.

32. Is epilepsy a mental disease and can it be cured?

Epilepsy is an organic disorder of the nervous system often accompanied by convulsions and by mental and emotional disturbance. Drug therapy is used for epilepsy and psychoanalysis and other psychotherapies for the accompanying emotional problems. An ordering of the patient's life is usually necessary to avoid fits from coming on. Although many epileptics have their disorder brought under control, and some seem to grow out of their difficulty gradually, there is no cure for the disorder. It is possible, however, to live with epilepsy. There are a large number of epileptics in the country whose disease is so well controlled, in many cases by drug therapy, that they can lead almost normal lives; most have never been inside a mental hospital.

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[3] See answer to Questions 18 and 44 of this Chapter, pages 319 and 328.

Statistically, epileptics are frequently grouped with mental defectives. This is a carry-over from the days when epilepsy was considered a form of deficiency. Although some epileptics are also mentally deficient, there is no necessary connection between the two conditions. In many states epileptics are still treated in the same institutions as mentals defectives rather than in hospitals for mental disease. As a result, little benefit is received from their treatment.

33. How many epileptics are there in the United States?

Estimates based on draft records of the two World Wars and special surveys indicate that 500,000 to 800,000 persons have epilepsy in this country. Only a fraction of the epileptics are hospitalized or kept in institutions of any sort.

34. What are the grades of mental deficiency?

Mental deficiency is classified according to the level of intelligence which the individual can attain. The lowest form, idiots, reach a mental age of three years or less; the mental age of imbeciles can be as high as seven years, and of morons, as high as twelve. These classifications are not hard and fast because intelligence is difficult to measure precisely, and many defectives are borderline cases. In addition, solving emotional problems may on occasion result in an apparent increase in intelligence.

The least severe deficiencies are the most common. In institutions for defectives there are about two and a half times as many morons as idiots, and nearly twice as many imbeciles as idiots.

35. What is the prevalence of mental deficiency?

Institutionalized mental defectives in the country now number about 120,000, but a great many are never placed in institutions. Estimates of the total number are 1,500,000 or more.

36. Is mental deficiency inherited?

Much mental deficiency is congenital. Familial mental defects are the most common forms, amounting to almost half of the classified hospitalized cases of defectives. Mongolism, which accounts for about one-tenth of the hospitalized cases of deficiency, can occur in families with no previous record of mental deficiency. Most nonfamilial and nonmongoloid types of deficiency are the result of diseases or injury.

37. At what age are most mental defectives admitted to institutions?

The median age at admission for mental defectives is just under 11 years. Although more than three-quarters of the defectives in special schools or institutions were first admitted before they had reached the age of 20, some came in at ages past 60. The median age at admission for idiots is about 9 years, while for imbeciles it is nearly 14 and for morons almost 15. On the whole, female defectives are about a year and a half older at admission than males. Since deficiency is present at birth in almost all cases, regardless of sex, the difference in age at admission is probably accounted for by the lesser difficulty in caring for girl defectives at home and possibly also by a greater unwillingness to send girls than boys off to institutions.

38. What is the length of stay in institutions of mental defectives?

Defectives, on the whole, spend more time in institutions than the seriously mentally ill, although a smaller proportion of them are being cared for in institutions. The lower rate of hospitalization for the defectives may be a result of their lesser involvement in bizarre situations calling public attention to their state. Their length of institutional stay reflects the relative incurability of mental deficiency. The average length of stay of defectives who died in New York State hospitals in 1947 was about 10 years.

39. How does the mortality of mental defectives compare with that of the general population?

Mental defectives as a group have a mortality many times that of the general population. The highest death rates are found among the lowest type of feeble-minded— the idiots. In a study in Massachusetts their death rates were nearly five times as high as the rates for the general population; at the younger ages the rates were more than ten times as high. Among imbeciles, the crude death rate was more than twice as high as in the general population. Both imbeciles and idiots had higher death rates in every age group than nondefectives. Among morons, mortality was much lower than among the other feebleminded, but it was higher, on an age-for-age basis, than for the general population.

40. Can mental defectives be trained to lead nearly normal lives?

A large number of persons who have been in institutions for the mentally deficient are later able to work and to get along fairly well. They are the borderline cases. Of the 4,200 aged 15 or more who were discharged from public institutions during 1946, 40 percent were judged capable of supporting themselves entirely and an additional 33 percent of helping to support themselves.

41. How general is the practice of sterilizing mental defectives?

In 1948, 27 states scattered throughout the country had laws permitting the sterilization of defectives and, in some instances, also of psychotics. By the end of 1948, a total of 49,207 individuals had been sterilized since the first of these laws was passed in 1907. In 1948 alone there were 1,336 such operations, or 2.2 per 100,000 persons in the states having sterilization laws.

42. How many mentally handicapped children are there in the public school system?

There were 102,000 children enrolled in special public schools for the deficient and the socially maladjusted in 1948. In 1946, about 44,000 were in boarding schools operated by various states for mentally deficient children or for juvenile delinquents. In addition, 182,000 children were attending classes for speech defectives in 1948. While not all speech defects are the results of mental deficiency or emotional disorder, a great many of them are.

43. What provisions are made for psychiatric help to school children?

In most parts of the country there is no provision for psychiatric help to school children. About 400 clinics—including a number which also treated adults—worked with school-age children, or one for every

120,000 children under 19 years old. A few states have systems of traveling clinics. In New York, for example, teams composed of a psychiatrist, a psychologist, two psychiatric social workers, and a clerk go from place to place testing school children and making recommendations.

44. What can be done to prevent mental disease?

A great deal can be done in every community toward giving the problems of mental health adequate attention. Teachers, lawyers, social workers, personnel workers, public health workers, doctors, nurses, and others have the primary responsibility for preventive work because their close contact with many individuals brings them opportunities to detect emotional stress. If they understand the needs of mental hygiene, situations which might result in mental disease can be avoided, and incipient cases of disorder can be dealt with before they become serious. There is obviously also a need for clinics to which the incipient cases of mental illness can be referred.

Educational institutions offer great possibilities for preventive work. Mass testing of students in schools and colleges, as some experiments in this direction have proved, would uncover a great many cases of mental sickness which had not yet become acute. Psychiatric orientation of teachers would lessen the adjustment difficulties which arise among school children. Proper sex education would go a long way to avoid misunderstandings and conflicts which may later result in mental illness.

All of these suggestions, which have been made by such groups as the National Health Assembly and the Institute on Public Health of the New York Academy of Medicine, require a great expansion in training and clinical facilities. This can be accomplished only by a coordinated program of voluntary and governmental agencies on all levels, local, state, and national.

45. What is the federal government doing about mental health?

Under the Mental Health Act passed in 1946, a mental health program was set up within the Public Health Service. The act created the National Institute of Mental Health at Bethesda, Maryland, to handle research both at its own 500-bed hospital and in field projects. It also provided funds for grants to states for expansion and operation of clinics, and to professional schools for expansion of psychiatric and mental hygiene training and for stipends to students. Research work on a large variety of subjects connected with mental hygiene is supported by federal funds, and demonstrations and clinics on mental health are held by the Public Health Service in conjunction with local medical and psychiatric organizations in various parts of the country. The Institute of Mental Health of the Public Health Service also issues pamphlets and other educational material for the general public. In addition to these activities, the United States Public Health Service, under the Hospital Construction Act, aids in the construction of mental hospitals.

46. What are the states doing about mental health?

All states maintain hospitals for the mentally diseased, and a year after the Mental Health Act went into effect there were only six without some sort of clinic facilities. Thirty-seven states had educational programs on mental health for either the general public, or for professional personnel, or both. Thirty-six states had training programs and 34 provided some professional services outside of state hospitals. Only seven states, however, had separate departments of mental hygiene. In most of the others, mental health activities were handled by the departments of health or of welfare.

The Mental Health Act greatly increased state participation in mental hygiene work. Most states are now engaged in a number of activities, but their programs are generally inadequate.

47. What is the World Federation for Mental Health?

The World Federation for Mental Health is a voluntary, nongovernmental organization started in 1948 by representatives from 22 nations. Recognized by UNESCO and the World Health Organization, it has already made a number of recommendations on programs to promote mental health. Membership in the federation is open to all nongovernmental organizations interested in the field of mental health. The world body will not only be a medium for the exchange of ideas on mental hygiene problems and for the correlation of work, but will also be a consultative agency for nations and international groups.

48. What are the voluntary organizations in the field of mental health in the United States?

There are a large number of professional groups, of which the American Psychiatric Association is probably the best known. The National Committee for Mental Hygiene, founded in 1909, was for many years a recognized leader in the field. Recently it merged with The National Mental Health Foundation and the Psychiatric Foundation to form The National Association for Mental Health. This organization, combining as it does the leadership in voluntary effort and professional skill, should serve more effectively to promote adequate care and treatment for the mentally ill and to improve the training programs for the psychiatric and allied professions.

49. What kind of research is being done on mental health problems and how much money is available for it?

A total of about $3,000,000 is now being spent a year for all mental health research work, including the sums allocated by federal, state, and local agencies and by private groups. In 1947 this came to $5 per patient in mental hospitals, as compared to about $90 spent on research per poliomyelitis patient in the same year.

Research projects cover a wide field, ranging from surgical and medical treatment to sociological studies. Techniques for prevention and group therapy and for accelerated individual therapy are receiving special attention because of the obvious need to use more efficiently what limited personnel and facilities there are.

XXI

OTHER DISEASES OF PUBLIC INTEREST

NOTE: Many questions of general interest relating to population and human biology have not yet been touched upon in this volume because they did not readily fit into any of the preceding chapters. A number of diseases which now hardly merit a separate section, formerly played an important role in our public health record; quite a number of these are still pressing problems in other parts of the world. Still other conditions illustrate the remarkable progress of medicine and surgery, as well as the advance of the public health program. Some questions of this type have been brought together at this point. The choice has necessarily been arbitrary, but it is hoped that those included help to round out the scope of the volume.

1. How does mortality from typhoid fever in the United States now compare with that in 1900?

The death rate from typhoid fever in the United States has dropped 99 percent since the turn of the century—from 31 per 100,000 in 1900 to 0.2 per 100,000 in 1948. In 1900, typhoid fever was an important cause of death and accounted for about one in every 50 deaths in our country; at present only about one in every 6,200 deaths is due to this cause. The virtual elimination of typhoid fever resulted largely from the purification of water, milk, and other food supplies, as well as from the development of efficient sewage disposal.

2. Where is typhoid fever still a public health problem?

Typhoid fever is still a problem of considerable magnitude in many areas outside of the English-speaking countries, the Scandinavian countries, and The Netherlands—that is, outside the countries where sanitary facilities and the general way of life are on a relatively high level. Examples of areas of relatively high mortality from typhoid fever are Mexico, with a rate of 18 per 100,000 in 1948; Peru, with 13 in 1947; and Italy, with 5 in 1949. Measures for the control of typhoid fever are under way in a number of areas, with the cooperation of the World Health Organization.

3. What are the common "pestilential" diseases that frequently become epidemic?

These diseases are cholera, smallpox, plague, yellow fever, and typhus. Measures for the control of their spread across borders have been sought by international conventions and treaties. The current tendency is to depend less upon quarantine measures and to emphasize the importance of preventive measures at the source of the disease. These preventive measures require the development of public health and medical services in the countries where these diseases are still widespread.

4. Has cholera ever been an important factor in mortality in the United States?

There were several serious outbreaks of cholera in the United States during the nineteenth century. These usually had their origin at seaports to which they were brought from overseas, and from which the disease spread inland. Several outbreaks of the disease were traced to immigrant ships. The last such occurrence was the outbreak in New York City in 1892.

5. In what areas of the world is cholera still prevalent?

Cholera is still widely prevalent in China and India. Both of these countries have had several outbreaks of the disease so far this century, religious pilgrimages being a common mode of spread in India. Although cholera is now relatively rare in the rest of the world, there is always the danger that the disease may spread from these two countries. A sizable epidemic with more than 10,000 deaths occurred in Egypt in 1947. It was brought under control through the intervention of the skilled workers of the World Health Organization.

6. What is being done to combat cholera?

By attacking cholera at its sources—in China and India—it should be possible to eradicate the disease, but this is a distant objective. The usual measures taken against cholera are protection of the food and water supplies and adequate sewage disposal. Where there is exposure to the disease, use is made of anticholera vaccines. Effective treatment of cholera by means of sulfa drugs has been reported. A system of radio broadcasts has been established by the World Health Organization to inform the world of any epidemics of cholera which develop. This gives other countries an opportunity to institute preventive measures.

7. What is brucellosis (undulant fever) and where is it found?

Brucellosis, or undulant fever, is an infectious condition transmitted to man from cattle, swine, goats, and sheep. Infection is usually acquired through raw milk or milk products. Brucellosis is rather common in livestock throughout the world, and causes great economic loss. It is often difficult to diagnose the illness in man and many cases are either undetected or are attributed to other diseases. Brucellosis is a special hazard to farmers, livestock workers and slaughter-house employees. The disease has been reported in man in practically all areas of the world.

8. What steps are being taken to reduce the incidence of brucellosis (undulant fever)?

Under the auspices of the World Health Organization, techniques for the diagnosis of brucellosis are being standardized and, with knowledge and experience now available, it should be possible to control and even to eradicate the disease in large areas of the world. A number of centers for this purpose have been set up jointly by the World Health Organization and the Food and Agriculture Organization.

9. How does mortality from syphilis vary according to age, sex, race, and marital status in the United States?

The death rate from syphilis is relatively high in the first year of life, when the disease is almost invariably congenital in origin. In the childhood ages the rates are extremely low and although they rise steadily with advance in age the rate in infancy is not reached again until midlife. The highest death rate is found just before age 70, after which it falls off somewhat. The death rate from syphilis among males is almost three times that of females; among nonwhites, the rate is nearly five times that for white persons.

Mortality from syphilis among single men is more than twice that for married men. Widowers have three and one-half times the syphilis death rate of married men, while for the divorced it is four times as high. Single women and married women have practically the same mortality from syphilis, but for the widowed and divorced the rate is over three times that for the married.

10. What has been the recent trend in mortality from syphilis in the United States?

The death rate from syphilis has been reduced by more than half in the last three decades, from 18 per 100,000 population in 1920–24 to only 8 per 100,000 in 1948. Many elements have contributed to this improvement, particularly in more recent years. An important preventive measure has been the legislation making blood tests mandatory before marriage and for pregnant women; most states now have these requirements. Control measures instituted by civilian and military health authorities during World War II have contributed much toward the improved situation. The physical examinations for Selective Service uncovered a large number of cases of syphilis; these were recommended for treatment. Mass screening surveys of the civilian population bring to light many unknown cases of the disease. Health education campaigns have not only a preventive effect, but also bring new cases for early treatment. Recently developed drugs, like penicillin, and the spread of rapid treatment centers have undoubtedly brought benefits in reduced mortality and promise even greater reductions in the future.[1]

11. What are some of the major complications arising out of syphilis?

After initial symptoms, the disease may not manifest itself again for many years, when it may produce inflamed enlargements of the heart, brain, kidneys, and other organs. The disease may lead to locomotor ataxia, a condition affecting principally the spinal cord, or to a general paralysis with mental disorders. The pregnancy of a woman infected with syphilis may result in a fetal death. Newborn babies may also acquire the disease, with all of its manifestations, from an infected mother.

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[1] See answer to Question 33 of Chapter XIX, page 305.

12. To what extent is syphilis a worldwide problem?

It is estimated that there are more than 2,000,000 deaths from syphilis in the world annually. No area of the world is free of the problem. The disease is particularly prevalent in countries which have a low standard of living. Special measures have been undertaken by the World Health Organization against syphilis. An attempt is being made to eradicate the disease in Haiti and extensive campaigns against it are under way in parts of Asia and the Americas, and in the Eastern Mediterranean. All phases of public health activity against syphilis are being strengthened in many areas, with particular attention to health education.

13. What are yaws and bejel?

Yaws and bejel are diseases very much like syphilis in characteristics, but are not transmitted in the same way. These diseases are most frequently found among children. Yaws and bejel are widely prevalent in the countries around the East Mediterranean, and are also common in the South Pacific, the southern areas of Asia, the central belt across Africa, Central America, and the northern tier of South America. The activities of the World Health Organization against yaws are closely tied in with the campaign against syphilis, since the treatment for both relies heavily upon the use of penicillin.

14. How prevalent is gonorrhea in the United States?

It has been estimated that about 1,800,000 people in the United States have gonorrhea. However, the disease takes a very small death toll, only 71 deaths being reported in 1948. The incidence of gonorrhea among nonwhites is more than 20 times that of the white population. The disease is about two and one-half times as frequent among males as among females. The disease is reported more frequently in the lower income groups than among those better situated.

Gonorrhea often results in sterility and not infrequently causes blindness in the newborn of mothers with the disease.

15. Is there an adequate treatment for gonorrhea?

Gonorrhea has been treated effectively with the antibiotics. Although the modern treatment is safe, simple, rapid, and inexpensive, it is not an unmixed blessing. As knowledge of the new treatments becomes more widespread, fear of the disease is lessening, with the result that reinfection is commonplace.

16. What was the "Black Death"?

The "Black Death" was an epidemic of plague during the fourteenth century that swept through all the world as it was then known —Asia, Africa, and Europe. It is said that about one-quarter of the population of the world died from this extremely virulent communicable disease. Whole communities were wiped out and its devastations greatly altered the economy of nations. No one then knew how to cure or prevent it, and terror and panic were widespread as people saw their families stricken and die from the mysterious illness.

17. Where is plague still common and how is its spread prevented?

Human plague is endemic in India and other parts of Asia. It is also found in some areas of South America and in North and South Africa. Except for a rare case, the United States is free from the disease.

Plague may be controlled by modern sanitary means. The disease is generally spread by rats and their fleas, and their eradication is therefore essential to its control. Among the steps taken in this direction are the rat-proofing of buildings and limiting the food supply of the rodents, chiefly through proper disposal of garbage. In places where ships arrive from plague-infected ports the preventive measures are quarantine and fumigation of the holds and cargoes.

18. How prevalent is leprosy today?

Leprosy was quite common throughout the world up to the Middle Ages. Since then, it has practically disappeared from Europe, except for countries on the Baltic and Mediterranean Seas. The disease is still fairly common in the Far East and all parts of the tropics. In the

United States, only about 40 new cases have been found annually in recent years.

19. Has leprosy ever been a serious threat in the United States?

Although leprosy has been brought into the United States many times, it has never been a major health problem here. Cases have been reported at one time or other from every state. A few cases were discovered among veterans of World War II, and among former inmates of Japanese concentration camps. The conditions favorable to the spread of the disease are now limited to a few states bordering the Gulf of Mexico.

20. What is tularemia and at what time of the year is it most common?

Tularemia, commonly known as rabbit fever, is a disease contracted from infected rodents, particularly rabbits. The infection in man is most often acquired by handling infected animals. Except for complicated cases, there is usually recovery from the disease. There were only 46 deaths from this cause in the United States in 1948. The number of cases of tularemia rises sharply with the beginning of the hunting season late in fall and reaches a peak in December. At that time the number of cases reported is about six times as high as in the period from February to October, the low level of the year.

21. Is tetanus important as a cause of death?

Tetanus is an infectious disease generally contracted through an injury or wound exposed to contamination. There are about 500 deaths from this disease in the United States each year. During World War II, tetanus among the armed forces was practically eliminated by routine immunization with tetanus toxoid. The treatment of the disease has been aided by the recently developed chemotherapy.

22. What is the history of smallpox in the United States?

Although Edward Jenner, an English physician, developed effective vaccination against smallpox in 1796, many years passed before it was used to full advantage. Meanwhile epidemics of the disease occurred repeatedly throughout the nineteenth century. In 1872, the smallpox death rate was 270 per 100,000 in Boston and 365 in Philadelphia. New Orleans, long a breeding spot for the disease, had a rate of 565 in 1883. Control over smallpox was finally achieved when vaccination was made compulsory in most of the country. However, incidents occurring from time to time show the value of vaccination and revaccination to guard against flare-ups of the disease brought into the country. In 1920, about 109,000 cases of smallpox were reported in the United States; in 1948, only 56 cases and five deaths were reported. (See Chart 18.)

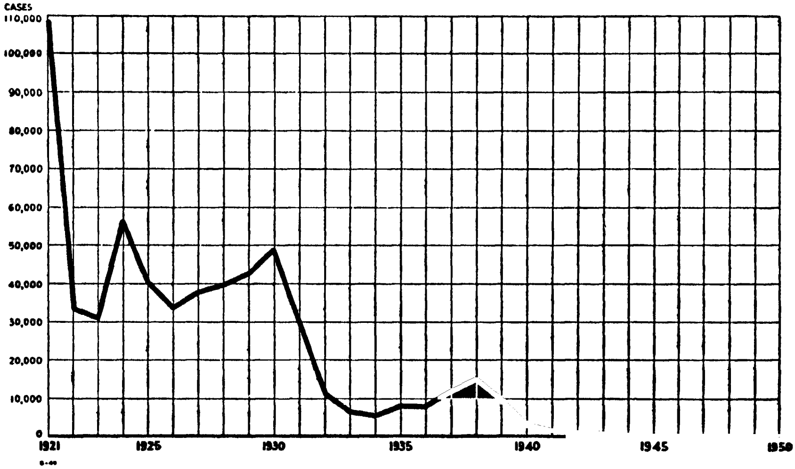

Chart 18. Cases of smallpox reported in the United States, 1921–1950.

23. In what areas of the world is smallpox still relatively common?

Much remains to be done before smallpox is eradicated from the world. The disease is still relatively frequent in India, China, and other parts of Asia; it is also an important health problem in large sections of Africa and Latin America.

24. What is dengue and where is it prevalent?

Dengue is a virus disease that is transmitted to man by a mosquito. The disease, rarely fatal, is widely prevalent in tropical and subtropical countries. It has been fairly common in a few of our Southern states and has occasionally been found as far north as Philadelphia. In 1949, only 45 cases of dengue were reported in the United States, 38 of them in Texas.

25. What has been the history of yellow fever in the United States?

There were severe outbreaks of yellow fever in New York and Philadelphia in 1668, the first time the disease was reported in North America. Up to 1821, there were 20 epidemics reported in Philadelphia, 15 in New York, 8 in Boston, and 7 in Baltimore. About one-eighth of the entire population of Philadelphia was carried off by the yellow fever epidemic of 1793, and one-tenth by another epidemic five years later. In some southern towns, outbreaks of the disease occurred almost continuously. As late as 1878, an epidemic of yellow fever in New Orleans killed off almost 2 percent of the population. In 1905, that city had the last epidemic of the disease experienced in this country. No cases of yellow fever have been reported in the United States for many years.

26. What is the outlook for eliminating yellow fever from the world?

Since the cause of yellow fever, its means of spreading, and the methods of prevention are known, it should be possible to eradicate the disease. Although the yellow fever mosquito, which carries the disease to man, is widely prevalent in most of the tropical and subtropical countries of the world, including our Southern states, control measures have been successful in most of these areas. At present, yellow fever is confined to certain parts of West Africa and South America. In many places the disease has been prevented from spreading by the simple expedient of drying up small amounts of stagnant water near homes. Stringent quarantine measures and vaccination of persons going to infested places are very important. Air transportation increases the chances of spreading yellow fever, for the traveling time from an infested area to one free of the disease is considerably less than its incubation period. Care is, therefore, taken to destroy mosquitoes on planes after their arrival from such areas.

27. Where is trachoma still prevalent?

Trachoma is a contagious disease affecting the eyelids and may result in total blindness unless there is early and adequate treatment. The disease is found in all parts of the world but it is especially prevalent in China, India, Egypt, and the Middle East. In some countries nearly the entire population is affected, according to the

World Health Organization. In the United States, less than 1,500 cases of trachoma were reported in 1949, most of them among Indians. The incidence of the disease in this country has been decreasing for many years. The newer methods of treatment with the sulfa drugs are effective.

28. What progress has been made against sleeping sickness?

Sleeping sickness is spread by a biting fly from infected wild animals, which are the source of infection, to domestic animals and man. The disease is a serious public health problem in many parts of Africa. Clearing away the brush is effective as a measure of control in some areas, but the most practical approach is to scatter insecticides, such as DDT, on a wholesale scale. A large number of substances have been used to destroy the parasite in animals and some new promising drugs have been developed recently to achieve the same result in man.

29. Where is malaria still an important disease?

In terms of the amount of sickness, disability, and economic drain it causes, malaria ranks very high among the debilitating diseases. Throughout the world, there are annually about 300,000,000 cases of the disease and 3,000,000 deaths from it, according to the World Health Organization. Malaria is widely prevalent throughout the world. The only areas comparatively free of the disease are the United States, Canada, the northwestern countries of Europe, the south of Australia, and New Zealand.

30. What is being done to wipe out malaria?

Malaria is controlled by draining swamps, marshes, and other breeding places of mosquitoes, and by spraying with DDT. These methods are being applied on a large scale by the World Health Organization, the Institute of Inter-American Affairs, and by the Economic Cooperation Administration, the latter working mainly through personnel from the United States Public Health Service. In Greece, for example, where malaria was very widely prevalent, the number of cases was reduced by concentrated efforts from at least 2,000,000 in 1942 to about 50,000 in 1949. At the same time, the incidence of other diseases was likewise reduced. The nation benefited by increased productive capacity without an increase in the numbers to be fed. In other parts of the world, vast areas have been freed from malaria by intensive and modern sanitary measures.

31. What is typhus fever and how widespread is it?

Typhus fever is an acute, infectious disease spread to man by lice, ticks, and fleas. The epidemic form is transmitted by the body louse, hence its spread is greatly facilitated by crowded conditions, and by poverty, squalor, and war. The disease is widespread in Asia, Eastern Europe, Egypt, and some other parts of Africa. It is relatively infrequent in the United States, Canada, and Western Europe.

32. How can typhus fever be controlled?

Under ordinary conditions of life, epidemic typhus fever is easily controlled by personal cleanliness. Where war has disrupted the customary sanitation practices, as in Italy during World War II, an effective control measure is to spray DDT on individuals, their clothes, and about their surroundings. Our servicemen have been made safe against the disease by routine vaccination. Recently developed antibiotics, such as chloromycetin and terramycin, are highly regarded for the treatment of the disease.

33. What is schistosomiasis and where is it prevalent?

Schistosomiasis (also called bilharziasis) is a parasitic disease widespread throughout the world. The parasite is a water-borne blood fluke which spreads to various parts of the body but particularly to the bladder and rectum. The infection may become chronic and last from 20 to 30 years. The disease is very common in Asia, Latin America, and Africa. According to the World Health Organization, there are about 150 million victims of the disease; in some countries as much as 90 percent of the rural population may be affected by it. Control of the disease is sought by destroying the eggs of the parasite, by treating infected people, and by destroying the snails which carry the parasite from water to man.

34. What is filariasis and how many are affected by it?

Filariasis is a disease caused by parasitic worms which live one stage of their life cycle in mosquitoes and invade the human lymphatic system following the bite of the mosquito. The parasite may live in the human body for some time without causing inconvenience until the lymph channels are blocked. One of the common forms of the disease is elephantiasis, in which the lower arms and legs and the external genital organs swell to enormous size.

According to the World Health Organization, filariasis probably affects 190 million people in Asia, Africa, Central and South America, and the Pacific Islands. It was formerly found in the southern part of our country but is now rare.

There is no satisfactory medication that destroys all the filiariae in the blood and treatment is only palliative. The best way to control the disease is by eradication of mosquitoes and by the use of screens.

35. What is trichinosis and how is it being controlled in the United States?

Trichinosis is a disease caused by the trichina worm, a parasite of the pig. Entrance into the human body occurs when undercooked, infected pork is eaten. Light infections may cause no symptoms, but if the pork is heavily contaminated, severe illness and death may result. In this country the disease is quite common, although it is usually so light as to be unrecognized. It has been estimated from autopsy and other records that more than 16,000,000 persons are infected in this country.

Thorough cooking is sufficient to kill the parasite in infected meat. Proper refrigeration and salting also kill it. Meat inspection does not seem to be of much value. Protecting pigs from rodents, and prohibitions against feeding them on offal from slaughterhouses help to prevent infection.

36. How common is hookworm disease?

Hookworm, or ankylostomiasis, is commonly found in all warm countries, especially where sanitation is not highly developed and the inhabitants are accustomed to go without shoes. The disease has brought much ill health and misery in tropical countries. Early in this century, surveys in our Southern states showed that from 12 to 60 percent of the population were infected. In the period from 1945 to 1949, there were 15 to 16 thousand cases reported annually in this country. It is especially prevalent in Georgia, Florida, and Mississippi, where almost 90 percent of the cases were reported in 1949.

The campaigns for building sanitary waterproof privies and other measures helped to control the disease in the South. The Rockefeller Foundation deserves great credit for the intensive sanitary and therapeutic measures carried on in the South and in Puerto Rico.

37. What are the most important diseases transmitted from animals to man?

More than 75 diseases can be contracted by man from animals. The most important of these are bovine tuberculosis, brucellosis, tularemia, rabies, trichinosis, and tapeworm infections. Also included in this group are glanders, anthrax, foot and mouth disease, psittacosis, and food poisoning of some kinds. Bovine tuberculosis has been practically eradicated here but it is still a problem in some other countries.

38. How much of a problem is goiter in the United States?

In some parts of the country, especially in those states surrounding the Great Lakes—the so-called "goiter belt"—the disease is an important health problem. According to surveys in some of these states, from one-half to two-thirds of the school children show signs of simple goiter. The continued use of iodized salt has helped to reduce this incidence.

Goiter is not an important cause of death. In 1948, there were fewer than 2,000 deaths from toxic or exophthalmic goiter, and the death rate was 1.4 per 100,000 population. The disease takes a much greater toll among women than men. Mortality from exophthalmic goiter is decreasing. In recent years marked advances have been made in the medical treatment of thyroid conditions, and where surgical intervention is required, the risk has been appreciably reduced. Not only has there been an improvement in diagnostic technique and surgical skill but there has also been wider use of chemotherapy and the antibiotics to combat the infections, particularly pneumonia which may follow surgery.[2]

39. What variations occur in the mortality from toxic goiter by age, color, and sex?

The mortality from toxic goiter, especially among women, increases with age. This disease is one of the relatively few in which women have higher mortality rates than men. There is little difference in mortality between white and colored persons.

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[2] See answer to Question 27 of Chapter XIX, page 302.

40. What is beriberi and how is it being brought under control?

Beriberi is a vitamin deficiency disease caused by lack of sufficient thiamine, or vitamin B_1, which is found in yeast, certain meats and vegetables, milk, and the germ of rice and cereals. The disease is prevalent where most of the people live chiefly on a diet of polished rice from which the vitamins and minerals have been removed. The principal areas affected are Malaya, China, the Philippines, Japan, and to lesser degree, India.

Substituting whole rice for the polished or refined kind, or enriching rice by the addition of rice bran or vitamin B_1 is effective in preventing beriberi. Large doses of the vitamin in concentrated form are valuable in the treatment of the disease.

41. Where was pellagra once prevalent in the United States?

Pellagra was very common some years ago in the southern part of this country, particularly in small cotton mill villages, and in mining and sawmill camps in rural areas. In these places, poverty and tradition narrowed the diet to corn meal, fat salt pork, and carbohydrates with few vegetables, especially in the winter and spring months. The disease was also found in orphanages, poorhouses, prisons, and hospitals for mental patients where the diet was lacking in fresh lean meat and fresh fruit and vegetables.

42. What discovery made it possible to control pellagra?

From studies started in 1914, Dr. Joseph Goldberger and his coworkers of the United States Public Health Service proved that pellagra was a result of an inadequate diet. An adequate diet requires sufficient amounts of certain vitamins, a proper food balance in general, as well as an ample quantity of food. Goldberger and his associates cured a number of cases by large daily doses of yeast added to the diet. Since then, yeast, which is a rich and economical source of vitamin B, has played an important role in the control of pellagra. The population in pellagra areas is encouraged to plant gardens for fresh vegetables and to keep a cow for a good supply of milk.

43. What medical development led to the rapid decline in mortality from pernicious anemia?[3]

44. What is multiple sclerosis and where is it found most frequently?

Multiple sclerosis is a chronic disease of the nervous system. The most common symptoms and signs are blurred vision, numbness of the extremities, tremors of parts of the body, weakness, difficulties in speech and in balancing and walking. The disease may develop suddenly or it may be gradual and progressive. Remission of the disease often occurs and the victim improves, but relapses usually recur. Since the cause of the disease is unknown, there is as yet no effective remedy for preventing it or stopping its progress.

Multiple sclerosis is found most often in cold damp climates. In the United States, it is most common in the North Atlantic Coast states and the Great Lakes region. In Europe, the highest prevalence is in France, Germany, Scotland, and the Baltic countries. The disease, which seems to be increasing in frequency in the United States and Europe, is receiving more adequate professional attention.

45. What is the significance of the Rh factor?

Rh is a blood factor present in 85 percent of the white population and in a higher proportion among the nonwhite. If a woman lacking this blood factor marries a man whose blood contains it, about half of the children of the couple will inherit the father's positive blood type. In these instances, during pregnancy the mother's system produces antibodies against the baby's positive blood, and these antibodies very often injure the unborn child. There is usually no danger to the first child, but in subsequent pregnancies these antibodies are likely to be numerous enough to destroy the baby's blood cells. Sometimes the baby is born dead; usually, however, it is born alive but suffering with a jaundiced condition known as erythroblastosis fetalis. In about one-fifth of the infants suffering from this condition, a typical form of cerebral palsy develops. It is estimated that only 13 percent of all marriages involve women with Rh negative and men with Rh positive blood.

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[3] See answer to Question 28 of Chapter XIX, page 303.

46. What is cerebral palsy and how many in the United States have this condition?

Cerebral palsy is a nerve and muscle condition caused by damage or faulty development of areas of the brain. Most cases occur before or during birth. The condition prevents normal use of one or more of the muscles involved in speech, sight, walking, standing, and movements of the hands and arms. Only about one-third of the cerebral palsied children are mentally retarded, and many of these can profit from specialized training. The remaining two-thirds range from slight mental retardation to superior intelligence; with long-continued, systematic, special training, most of those with the disease can become self-maintaining.

It is estimated that there are about half a million cerebral palsy victims in the country today, and that about seven per 100,000 population are born each year. Many of these infants are so severely handicapped that they are especially susceptible to infections; almost one-seventh die within the first five years of life.

47. What factors have contributed to the recent reduction in mortality from ulcers of the stomach?

The death rate from ulcers of the stomach has been declining for more than a decade. Diagnostic procedures have advanced rapidly with increased use of the gastroscope and X-ray techniques. At the same time medical management of the disease has improved. Treatment is now planned on a long-range basis instead of being directed singly to the relief of acute episodes. The small proportion of cases undergoing surgery are benefiting from new procedures and other advances that have reduced the frequency of fatal postoperative complications.[4]

48. What has been the trend in mortality from appendicitis in recent decades?

The death rate from appendicitis in the United States fell from a high of 15.2 per 100,000 population in 1930 to only 2.9 in 1948. This reduction reflects a variety of factors, particularly improved diagnostic procedures which have helped bring patients to operation before complications set in, and improvements in the care and treatment of cases. In the past decade, additional impetus was given to the downward trend by application of chemotherapy in cases complicated with peritonitis. In a number of hospitals the case fatality rates have been reduced to less than one percent. The rapid growth of prepayment hospital insurance plans has enabled patients to seek medical care more promptly.

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[4] See answer to Question 32 of Chapter XIX, page 304.

Credit must also be given to the campaign to educate the people against the dangers in taking laxatives to relieve abdominal pain, a practice which greatly increases the chances of perforation and peritonitis when appendicitis is present. It is significant that where education stressing the value of early hospitalization and avoidance of laxatives has been actively carried on, the percentage of cases complicated with perforation and peritonitis has shown an especially marked decrease.

49. How does mortality from cirrhosis of the liver vary with age, sex, and marital status?

Under age 35, the death rate from cirrhosis of the liver is negligible, but thereafter it rises rapidly with advance in age. Thus, in 1948 the rate in the United States increased from 3.7 per 100,000 at ages 30 to 34 years to 36.2 at ages 60 to 64. From ages 40 to 80, the death rates from cirrhosis of the liver for white males are double those for white females.

The mortality from cirrhosis of the liver among married men is considerably lower than that of single or widowed and divorced men. The rates among married women, on the other hand, are higher than those of the unmarried, but somewhat lower than for widows. Divorcees have much the highest mortality at practically every age group.

50. Has rabies been eradicated in the United States?

Rabies has not been eradicated from our country. However, because prompt treatment is usually available, the loss of life from this infection is relatively small. In 1948, there were 24 deaths reported from this disease. In the same year, over 6,000 cases of rabies were reported in animals in the United States.

Rabies is a rapidly fatal infection which is generally contracted by a bite of some animal, usually a dog. Rabies can be controlled, and in large measure eradicated, by muzzling dogs. Annual vaccination of dogs against rabies has also been used. Rabies was eradicated in England after a muzzling order was enforced, and a quarantine put on dogs coming into the country. Rabies can be a menace in countries where there are large numbers of stray, uncared-for dogs, and where there are wolves, jackals, foxes, and hyenas.

XXII

OUR BODY BUILD

1. What is the average weight and length of babies at birth?

At birth, boys weigh seven and four-fifths pounds on an average, and girls seven and two-fifths pounds. An infant weighing less than five and one-half pounds at birth is generally considered premature. The average length at birth is twenty and one-half inches for boys and twenty inches for girls.

2. At what rate do babies increase in weight in their prenatal period?

The rate of growth is rapid during prenatal life. At the fourth fetal month it is about three and one-half ounces per month; just before birth, it is nearly two pounds per month.

3. What is the average height and weight of children at successive ages?

The average baby, at the end of the first year of life, weighs about three times what it did at birth. The rate of gain is much less thereafter. At the end of the second year, the average boy baby weighs 26 pounds, about one pound more than the average girl. Except at ages 11 to 13, the average weight for boys is greater than that for girls of the same age.

At the end of the first year of life, the average baby is eight to ten inches taller than at birth. The average height at birth is doubled by the time the child is about four and one-half years old, and tripled by 13 or 14 years of age. Boys are taller than girls except at 11 to 13 years.

The average height and weight of boys and girls from ages 4 to 17 years are shown in Table 1.

Table 1
Average Height and Weight of Boys and Girls
Age 4 to 17 Years

Age	Height (inches)		Weight (pounds)	
	Boys	Girls	Boys	Girls
4	41.0	41.1	38.6	37.5
5	44.1	43.6	43.2	41.8
6	46.4	46.0	47.8	46.5
7	48.5	48.1	52.6	51.5
8	50.7	50.3	58.3	57.1
9	52.7	52.2	64.3	63.1
10	54.5	54.4	70.4	70.2
11	56.3	56.7	76.9	78.8
12	58.3	59.1	84.9	89.1
13	60.7	61.0	95.1	98.9
14	63.1	62.2	106.9	106.2
15	66.1	63.2	123.4	114.2
16	67.6	63.4	133.2	116.7
17	68.4	63.4	139.2	117.5

Source: Body Measurements of American Boys and Girls. U. S. Department of Agriculture: Misc. Publication No. 366, Washington, D.C. 1941.

4. What changes in body build (other than height and weight) occur among children in the course of development?

There are great differences in the body proportions of adults and children. The head of a child is relatively larger than that of an adult and the legs are relatively shorter. As the infant matures to an adult, the size of the head doubles, its arms become four times as long, the legs five times as long, and the trunk three times. An idea of the changes in some body measurements for boys and girls as they pass from ages 4 to 17 may be obtained from Table 2. For all but a few of the measurements shown, the body dimensions of boys exceed those of girls.

Table 2
Selected Body Measurements of Boys and Girls
At Ages 4 and 17 Years (in inches)

Body Measurement	Boys		Girls	
	Age 4	Age 17	Age 4	Age 17
Chest girth	22.3	35.8	21.8	32.6
Waist girth	20.3	28.3	19.8	25.4
Upper arm girth	6.5	10.6	6.5	9.8
Neck base girth	10.9	16.1	10.7	14.4
Thigh girth	12.5	21.3	12.8	21.1
Hip height	19.4	35.3	19.5	32.4

Source: Body Measurements of American Boys and Girls. U. S. Department of Agriculture: Misc Publication No. 366, Washington, D.C. 1941.

5. At what age do boys and girls reach puberty?

Among boys, the average age at puberty is about 15 years, and among girls about 13. However, in individual cases it is not uncommon for puberty to appear as early as age 10 or as late as 17. In girls, the onset of fertility generally lags four or more years behind the onset of the menses.[1] The age at puberty is influenced by a number of factors, such as social conditions, nutritional status, and health status. Contrary to popular impression, girls in tropical and subtropical countries do not mature earlier than those living in temperate climates. In subtropical and tropical countries development is relatively slow. Long periods of extreme cold retard development much as does tropical heat.

There has been a trend, at least within the last half century, for puberty to occur at a somewhat earlier age, on the average. This is particularly evident in the United States, Canada, and Western Europe. In large degree, this change represents better nutrition and greater freedom from debilitating diseases during childhood.

6. Has there been any change in the average height of young people during the past few decades?

Comparable figures, as far as available, show that present-day adolescents weigh more, and are somewhat taller than those of a few decades ago. For example, the young men entering service in World War II were, on an average, about two-thirds of an inch taller and about ten pounds heavier than those accepted in World War I. Increases in height and weight have been observed in many comparisons of college students with those of the preceding generation. A comparison of heights of mothers and daughters who attended college showed that on the average, the daughters were one and one-eighth inches taller.

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[1] See answers to Questions 1 and 2 of Chapter II, page 15.

7. What factors influence the rate of growth of children?

External factors, more than anything else, influence the rate of growth of children. The food they eat, the water they drink, the climate they live in, their standards of living, and their opportunity for play and exercise contribute toward their development. Inheritance is obviously an important factor also in the growth of children. The occurrence of certain diseases may also have noticeable effects on the rate of growth of children.

8. Does the growth of children vary with the seasons?

The growth of children tends to be slowest during winter, somewhat more rapid during spring, and most rapid during summer.

9. Are height and weight an index of good nutrition of children?

The usual tables showing the height and weight of children corresponding to their ages do not provide a satisfactory index to select the undernourished. Only by a careful physical examination can a physician tell whether or not a child is undernourished. In one test survey, only one-quarter of the children considered undernourished by a physician would have been judged so according to the standard height and weight tables.

10. What is the average height of adults in the United States?

According to insurance records, the average height of adults, taken with shoes on, is 5 feet 8½ inches for men and 5 feet 4¼ inches for women. Ten percent of the men were over six feet tall; only a fraction of 1 percent were under five feet. Just 1½ percent of the women were under five feet tall, but only 0.1 per cent were over six feet.

11. Are there regional differences in average height within the United States?

The average height of men taken for service in World War I ranged from 5 feet 8⅖ inches in Texas to 5 feet 6⅖ inches in Rhode Island (all measurements were made without shoes). The four states with the tallest men—Texas, Oklahoma, Mississippi, and Tennessee—are in the South Central area of the country. The seven states with the shortest men—Rhode Island, Connecticut, Pennsylvania, New York, Massachusetts, New Jersey, and New Hampshire—are in the northeast corner of the country.

12. Are there differences in the average height of ethnic groups within the United States?

The Scottish, with an average height of five feet eight inches, were the tallest among the men demobilized after World War I. Shorter than they, in order, were the English, Germans, Irish, Poles, French, Jews, and Italians, the last with an average of five feet five inches.

13. How does the height of adults vary throughout the world?

People tend to be short where the environment is harsh or the food supply poor. Tropical jungles and arctic areas are the homes of most of the races of excessively short stature: for example, the Negrillos of Central Africa, some Indian tribes of Central South America, and the Eskimos, Lapps, and Siberians in the extreme North. There is a great range in height among the peoples of the temperate zones. In the Northern Hemisphere, the citizens of the United States and Canada, the Scandinavians, Scots, and some groups of English are the tallest among the nationality groups of European origin. Some of the native tribes of East Africa outstrip all of them with an average height for men of six feet or more. In South America, the Patagonians—where the men also average better than six feet—are the tallest.

14. What is the significance of dwarfism and giantism in terms of longevity?

For the most part, very short and very tall persons merely represent the extremes of normal height distribution, and their longevity does

Table 3
Standard Table of Heights and Weights

Height		Average Weights According to Age Periods							
feet	*inches*	20–24	25–29	30–34	35–39	40–44	45–49	50–54	55–59
		MEN							
4	11	117	122	125	127	130	132	133	134
5	0	119	124	127	129	132	134	135	136
5	1	121	126	129	131	134	136	137	138
5	2	124	128	131	133	136	138	139	140
5	3	127	131	134	136	139	141	142	143
5	4	131	134	137	140	142	144	145	146
5	5	135	138	141	144	146	148	149	150
5	6	139	142	145	148	150	152	153	154
5	7	142	146	149	152	154	156	157	158
5	8	146	150	154	157	159	161	162	163
5	9	150	154	158	162	164	166	167	168
5	10	154	158	163	167	169	171	172	173
5	11	158	163	168	172	175	177	178	179
6	0	163	169	174	178	181	183	184	185
6	1	168	175	180	184	187	190	191	192
6	2	173	181	186	191	194	197	198	199
6	3	178	187	192	197	201	204	205	206
		WOMEN							
4	11	113	116	119	122	126	129	131	132
5	0	115	118	121	124	128	131	133	134
5	1	117	120	123	126	130	133	135	137
5	2	120	122	125	129	133	136	138	140
5	3	123	125	128	132	136	139	141	143
5	4	126	129	132	136	139	142	144	146
5	5	129	132	136	140	143	146	148	150
5	6	133	136	140	144	147	151	152	153
5	7	137	140	144	148	151	155	157	158
5	8	141	144	148	152	155	159	162	163
5	9	145	148	152	156	159	163	166	167
5	10	149	152	155	159	162	166	170	173
5	11	153	155	158	162	166	170	174	177
6	0	157	159	162	165	169	173	177	182

Source: Joint Committee on Mortality of the Actuarial Society of America and Association of Life Insurance Medical Directors of America: Medico-Actuarial Mortality Investigation—1912.

not differ materially from the average. True dwarfism and giantism, however, reflect pathological conditions and are often accompanied by bodily disproportions or physical manifestations in addition to abnormal height. In most cases giantism is the result of pituitary dysfunction. Dwarfism is usually the result of thyroid deficiency, but some cases are due to pituitary or other disorders.

Longevity of giants and dwarfs depends partly upon the cause of the abnormality. Pituitary giants do not live long. The longevity of dwarfs whose condition is of thyroid origin is also impaired, but not to as great a degree.

Table 4
Ideal Weights for Men and Women Ages 25 and Over

Height (with shoes)		Weight in Pounds (as ordinarily dressed)					
		MEN			WOMEN		
ft.	*in.*	Small Frame	Medium Frame	Large Frame	Small Frame	Medium Frame	Large Frame
4	11	—	—	—	104–111	110–118	117–127
5	0	—	—	—	105–113	112–120	119–129
5	1	—	—	—	107–115	114–122	121–131
5	2	116–125	124–133	131–142	110–118	117–125	124–135
5	3	119–128	127–136	133–144	113–121	120–128	127–138
5	4	122–132	130–140	137–149	116–125	124–132	131–142
5	5	126–136	134–144	141–153	119–128	127–135	133–145
5	6	129–139	137–147	145–157	123–132	130–140	138–150
5	7	133–143	141–151	149–162	126–136	134–144	142–154
5	8	136–147	145–156	153–166	129–139	137–147	145–158
5	9	140–151	149–160	157–170	133–143	141–151	149–162
5	10	144–155	153–164	161–175	136–147	145–155	152–166
5	11	148–159	157–168	165–180	139–150	148–158	155–169
6	0	152–164	161–173	169–185	—	—	—
6	1	157–169	166–178	174–190	—	—	—
6	2	163–175	171–184	179–196	—	—	—
6	3	168–180	176–189	184–202	—	—	—

Source: "Ideal Weights for Women," Statistical Bulletin, October 1942, and "Ideal Weights for Men," Statistical Bulletin, June 1943, Metropolitan Life Insurance Company, New York.

15. What is the average weight of adults in the United States?

The average weight of adults (not the "ideal" weight, which is discussed in question 16) varies both with height and age. Table 3 shows the average weights of men and women according to their height and age.

16. What is meant by "ideal" weight?

"Ideal" weight is that most conducive to health and longevity. Most people continue to grow heavier throughout the greater part of their lives, but insurance studies have shown that it is healthier for adults to remain at a fairly constant weight, usually that suitable at about age 30.[2] Although "ideal" weight is independent of age after maturity, it is dependent on both height and body frame. Table 4 shows "ideal" weights for men and women according to height for each of three types of body frame—small, medium, and large. The table is based on the experience of hundreds of thousands of insured persons.

17. Are the adult women in the United States thinner today than a generation ago?

An insurance study showed that over a ten-year period the average weight of women at each height declined. The reductions were generally from three to five pounds. They were fairly uniform according to age, being about as great for the older as for the younger women.

Table 5
Selected Body Measurements of White Servicemen, World War I in Inches

Height, standing	67.7
Height, sitting (from bench to top of head)	35.6
Leg length (from fold of buttock to just below ankle)	28.2
Knee height	18.5
Arm length (from shoulder around elbow to wrist)	25.2
Chest circumference at rest	35.0
Waist	30.7

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[2] See answer to Question 17 of Chapter XIX, page 298.

18. What are the averages for the principal body measurements of men?

Average body measurements of men are available from studies of servicemen in World War I, most of whom were between ages 20 and 30. Table 5 is based upon the records for approximately 100,000 such men at demobilization.

19. What are the averages for the principal body measurements of women?

Body measurements of more than 10,000 white women were compiled by the Department of Agriculture for the guidance of clothing manufacturers. From the averages in Table 6 it can be seen that the proportions vary somewhat with age. The girth measurements are larger for the older women and the height measurements are slightly smaller. Since there is a generation between the two groups of women listed here, some of the differences may be accounted for by changes in height and weight which have gradually been taking place in the country.

Table 6
Selected Body Measurements for White Women, 1939–1940

	Ages 25–29	Ages 50–54
Height, standing	63.4 in.	62.6 in.
Hip height	31.7	31.2
Knee height	17.3	17.0
Arm length (from shoulder and around elbow to back of wrist with arm flexed)	23.0	23.0
Bust girth	34.2	38.3
Waist girth	27.3	32.9
Hip girth	37.8	40.7
Ankle girth	9.2	9.5
Upper arm girth	10.9	12.4
Weight	124.7 lb.	149.6 lb.

20. How may the various types of body build be classified?

The three body build classifications used today by many anthropometrists are: endomorphic, or chubby persons, with a predominance of soft, round contours and with relatively massive viscera; mesomorphic, or athletic, with more normal proportions and a predominance of muscle, bone, and connective tissue; and ectomorphic, or long, thin, and relatively fragile, with the greatest skin area and brain weight in relation to body weight. Seldom, however, does any individual fit perfectly into one of these categories. Instead, although a person may be largely of a certain type, he usually presents some of the characteristics of the others.

21. Is body build influenced more by heredity or environment?

Heredity sets the direction in which the body will develop but external factors, such as the amount and quality of food, exercise, etc., greatly influence the outcome. Consequently, neither heredity nor environment can be said to be the more important.

22. Is body build a factor in disease?

This appears to be true in certain diseases, but the cause for the high incidence of those ailments in persons of a certain build are not yet understood. It is known that fat persons are especially susceptible to diabetes, cardiovascular-renal diseases, and arthritis. They also seem to have a somewhat higher prevalence of gall bladder trouble than other types. Tall, thin persons, on the other hand, are more likely to develop stomach ulcers.

23. Is personality influenced by body build?

Only very rough generalizations can be made about the personality characteristics likely to be found among persons of different body builds. The exceptions will certainly be many, and the relationship is far from invariable. Both personality formation and body build may be controlled by a third common factor, or it may be that one of the two has a strong influence on the development of the other.

Studies have shown that endomorphs, or chubby persons, are likely to be relaxed and to have a love of comfort. They often take great pleasure in eating, exhibit a hunger for affection and approval, have a need for company when they are troubled, and they are frequently sound sleepers.

Mesomorphs are more likely to be assertive and energetic, to have a directness of manner and an unrestrained voice. Their appearance may be overmature; they often show a need of exercise and when troubled feel a necessity for action.

Ectomorphs tend to be restrained, and inhibited in talking and in social relations, will have fast reactions, and a youthful intentness. Frequently they are light and restless sleepers and when troubled feel a need for solitude.

In addition to these general conclusions, there may also be a direct causal relationship between extreme body builds and personality. A very short person, for example, could hardly remain unaffected by his stature, which would undoubtedly influence and perhaps restrict his social activities.

24. Is mental development influenced by body build?

There is no evidence that body build influences mental development. Tall persons are not in general brighter than shorter chubby persons nor are athletic types generally unintelligent. Variations in intelligence appear to be independent of the type of body build, but some studies have shown that children with superior intelligence are also likely to be better developed physically than others, regardless of type.

25. When does growth cease?

Human beings ordinarily reach their full stature before the age of 25. After about 40, humans usually begin to shrink about 0.4 of an inch a decade as the cartilage in the joints and in the spinal column contracts.

26. How does the average weight of the human brain vary from birth to maturity?

At birth, a baby's brain is bigger in relation to its body than the brain of any other animal. The brain of a normal newborn infant weighs about one pound, or approximately one-seventh of the baby's total weight. For the first five years the human brain grows rapidly, then more slowly, and at about the age of 20 it stops increasing in weight. Late in life it may even become somewhat lighter. The brain of an adult man weighs on an average about 3 pounds 1½ ounces about 1/40 of his total weight) and that of an adult woman about 2 pounds 12 ounces.

27. Is there any relation between brain size and mental ability?

In general, there is not. At the extremes of brain size, however, one is more likely to find disease or deformity which is associated with mental deficiency.

28. What is the size of the adult heart?

At birth the heart of a normal baby weighs less than an ounce. In adults the heart is usually about 1/250 of body weight. The range is from about 7 to 14 ounces, averaging about 10½ ounces for men and nearly 9 ounces for women.

29. What is the average pulse rate for men and women?

The average pulse rate of adult men at rest is about 72 beats a minute and of adult women is about 80. Pulse rates as low as 35 and as high as 100 may be still within the normal range.[3] During an ordinary day there are great fluctuations in the pulse. The rate usually is lowest during sleep and goes up toward the middle of the day. Activity, digestion, and emotional changes cause temporary speeding of the heart beat.

The pulse also varies with age. The average rate at birth is about 130 beats a minute and at the end of the first year around 100 or 110. By 12 years of age the rate has usually fallen to around 85, and after puberty it decreases to the adult rate.

30. How many times does the heart beat in a lifetime?

If a person has a pulse rate of around 72 beats per minute and lives for a full three-score and ten years, his heart beats more than two and one-half billion times.

31. How much blood does the human heart pump each day?

In a normal healthy adult the heart pumps at a rate of approximately 2,600 gallons a day. At each beat the average adult heart discharges about seven and one-half ounces of blood, or nearly a half pint.

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[3] See answer to Question 20 of Chapter XII, page 181.

32. How many quarts of blood are there in the body?

The amount of blood in the body varies from about three and one-half to five and one-half quarts or from 5 to 7 percent of body weight. It is possible to lose about one-third of this and still survive.

33. What is the average blood pressure for men and women? [4]

34. Are there racial differences in blood pressure?

The average blood pressure of American Negroes is higher than in whites. In contrast, the blood pressure of African Negroes has been found to be approximately the same as that of white men in this country at ages up to 40, but after that age the averages for the Negroes were lower; moreover, these averages tend to decline with advancing age. The blood pressures of Asiatics generally are appreciably below those of Europeans.

The reasons for these differences are not definitely known. In part they may represent differences in climate, nutritional status and diet, because these factors influence the blood pressure level. The low blood pressures recorded among the Chinese have been ascribed by some to the low level of protein in the diet or to some factor in rice, their chief food. However, their nutritional status is generally greatly inferior to that of Western peoples. Also they tend to be of slight build. This itself partly explains their low blood pressure since even among Western peoples a definite association is found between body build and blood pressure, with underweights showing significantly lower levels of blood pressure than heavier people.

35. What are the principal factors influencing blood pressure?

Emotional stress usually causes a temporary rise in blood pressure, often of considerable degree and, if frequent and long-continued, may eventually result in a permanent rise. Heredity also plays a significant role in high or low blood pressure. The decrease in the elasticity of the arteries with advancing age is considered by some authorities to be a prime cause of the gradual rise in blood pressure. Certain types of kidney disease and endocrine gland disorders also may elevate the blood pressure well above the average for age.[5]

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[4] See answer to Question 21 of Chapter XII, page 181.

[5] See answers to Questions 22 and 23 of Chapter XII, pages 181 and 182.

36. What is the average rate of respiration?

In the new born, the respiration rate lying down is ordinarily about 40 breaths per minute or even higher, about 30 in infants, 25 in five-year-olds, and 13 in adults. Occasionally, cases are reported with extremely slow rates: healthy men with rates as low as six and healthy women with rates as low as three. In general, however, women breathe faster than men by about two to four breaths per minute. Disease—particularly fevers—exercise, and glandular activity increase the rate, and sleep slows it down. The additional energy expenditure necessary to sit up raises the respiration rate about 5 breaths per minute over what it is while lying down. The rate standing is about 4 breaths per minute above that sitting.

37. What is the average temperature of the body?

The temperature is ordinarily taken by mouth or rectum. The average mouth temperature is about 98.6° F, and rectal temperature one degree higher. Children are likely to have a normal temperature about one degree higher than most adults, and the very old may also have a slightly higher temperature. The temperature of children is easily disturbed and a high fever at young ages is not nearly so significant as in middle life. The time of day, the activity, the season, climate, clothing, and food affect temperature slightly. Body temperature is normally lowest between three and five in the morning and rises during the day to a high in late afternoon or evening. In some persons the normal temperature may be one degree or more above or below the average.

Temperatures that are too low or too high can be a serious threat to life. Persons can live only a short time with a temperature below 95° F, although it is possible to recover from a brief drop to as low a point as 75° F. Fever of about 111° F is usually fatal.

38. What is the normal rate of basal metabolism for men and for women?

Basal metabolism is the minimum rate at which the body produces energy when it is at rest. The surface area of the body, the glandular balance, and the state of health or disease affect the basal metabolism. It is measured in terms of heat (energy) units per hour.

A healthy adult man has a rate between 38 and 40 calories per hour and a woman between 36 and 38. Variations of as much as 10 percent from the average are not unusual.

The basal metabolic rate in very young children is higher than in adults, but the mature rate is normally reached around the ages of three to six years.

39. Does physiological age differ from chronological age?

Physiological age generally parallels chronological age, but in some cases greatly differs. At age 70 or 75, for instance, some men are vigorous and productive, while on the other hand some at 50 may be almost physically or mentally senile. Even in the individual, different organs of the body may not age at the same rate. A man whose chronological age is 50 may have a liver physiologically comparable to the average man of 65 or 70; the same person, however, may have a heart as young, strong, and efficient as in most men of age 30. It is common arbitrarily to label a person mature at age 21 or old at 65, but such characterization may be far from warranted in a physiological sense.

XXIII

THE PUBLIC HEALTH AND ITS ADMINISTRATION

1. What is meant by "public health"?

The term "public health" has been defined by Professor C.-E. A. Winslow, one of the leaders of the public health movement in this country, as: ". . . the science and art of preventing disease, prolonging life, and promoting physical and mental health and efficiency through organized community efforts . . ."

2. What do public health agencies do?

The United States Public Health Service has listed more than three dozen specific types of public health activity. Roughly, public health work can be divided into two categories: the environmental and the human. The first involves control of the surroundings to make them healthful and free from contamination or danger. The second involves services to the people themselves, to build up their strength and immunity and to prevent the spread of disease if it should break out. The chief public health activities to be found in this country are shown on page 365.

3. How did modern public health work begin?

Modern public health work dates from the social crusades of the first half of the nineteenth century in England. With the industrial revolution came harsh working conditions and crowded and unsanitary housing. Agitation for reform resulted, in 1848, in the first

Public Health Act in England and in the creation of the General Board of Health. This board was in existence for only about ten years, but it was the beginning of a century of extraordinary developments in sanitation, hygiene, preventive medicine, and other branches of public health.

MAIN PUBLIC HEALTH SERVICES

Environmental

- Sanitation of sewage and other wastes
- Protection of water supplies
- Insect and rodent control
- Inspection of food, drugs, and cosmetics
- Licensing of certain businesses and professions
- Control of narcotics
- Regulation of health standards for housing and industry
- Control of smoke, fumes, and odors
- Examination of incoming aliens, and of plants, animals and other shipments

Human

- Communicable disease control and reporting
- Laboratory testing for various diseases
- Provision of vaccines and serums
- Case finding surveys (i.e., mass X-rays for tuberculosis, blood tests for venereal disease, etc.)
- Provision of hospital and medical care for needy and for those with certain ailments (tuberculosis, venereal disease, cancer)
- Operation of hospitals for tuberculosis and mental patients
- Operation of special clinics for:
  - maternal and child health
  - dental health
  - mental hygiene
- School health examinations and other school health services
- Collection of vital statistics
- Health education

4. Did the ancients know about public health?

The ancient Hebrews had sanitary codes which may well have been passed down from the rule of Hammurabi, King of Babylon about 2000 B.C. The Minoans, whose civilization on the island of Crete flourished about 1500 B.C., had sewers and baths. The later Greek and Roman civilizations also had excellent sanitary provisions. The Romans built elaborate aqueducts to get pure drinking water to their city; their public baths were famous; and their main sewer, the Cloaca Maxima, is still in use. Both Demosthenes and Plutarch served as health officers. Unfortunately, after the fall of the Roman Empire, interest in sanitation and public health practically died out, and the whole field had to be developed again in modern times.

5. When was the first state board of health established in this country?

The first permanent state board of health was established in Massachusetts in 1869. It was the delayed result of Lemuel Shattuck's study of health and sanitation in Boston which was published in 1850. Shattuck, who is generally thought of as the founder of the American public health movement, had discovered the most appalling conditions, not much different from those which had started the social crusades somewhat earlier in England.

The Massachusetts law setting up the State Board of Health was used as a model by most of the other states. California established a board in 1870, and Congress set one up in the District of Columbia in 1871. The last state to follow suit was New Mexico, in 1919.

6. How has public health work expanded during the last 100 years?

In the beginning, the public health movement in this country, as in England, was largely concerned with cleaning up physical filth. This was a natural development of Lemuel Shattuck's historic exposure of the conditions in some sections of Boston. At that time the filth and miasma theory of disease—that it was caused by decaying matter in sewage, waste, and rubbish, and spread through the air by drifting particles—was gaining popularity. Although the theory was not strictly correct, sanitation did result in great improvement in mortality. Many of the diseases which had killed large numbers of people—typhoid, cholera, and infant diarrhea and enteritis, for example—were directly connected with lack of cleanliness.

In the last two decades of the nineteenth century, the field of public health was revolutionized by the researches of Louis Pasteur and Robert Koch. The germ theory of disease, which they had done so much to establish, opened a new approach to preventive medicine. By 1900, most of the populous states and the larger cities in this country had regular health departments or boards of health and were campaigning against the communicable diseases, particularly smallpox, typhoid, tuberculosis, anthrax, cholera, and diphtheria, and the other principal childhood infections. Isolation, quarantine, and often vaccination and inoculation were used. The success, in general, was startling. However, this was not the case for tuberculosis, which infected a large proportion of the population. There was no effective means of vaccinating against this disease.

The achievements of Edward L. Trudeau in treating tuberculosis patients at his Saranac Lake Sanatorium lent weight to a theory about the importance of vital resistance, namely, that it could be built up by rest, personal hygiene, proper diet, and a well-ordered life. The wide application of this theory to public health work has reduced the deaths from tuberculosis to a marked degree. Later still, the discoveries of biochemistry made it possible for the medical profession to reduce the mortality from pneumonia and other infections.

By a combination of sanitation, preventive and curative medicine, personal hygiene, and health education, public health work has now cut down the dangers of infancy, childhood and early adult life. However, tuberculosis is still a challenge. Today, the other chronic diseases, including mental illness, are consuming a large share of the efforts of physicians and health officials. The field of public health has not shifted, but as the knowledge of health and medicine has grown, it has expanded to include many new activities along with the old ones.

7. What is the World Health Organization?

The World Health Organization, which at the end of 1951 had 78 member nations, is open to all countries regardless of whether or not they are in the United Nations. It is not just a consultative body but engages actively in the promotion of health on an international basis. At present, its main efforts are aimed at control of malaria, tuberculosis, and venereal disease, and at the prevention of future pandemics of influenza and other epidemic infections. With teams of experts and special equipment and drugs, it has been attacking disease in many parts of the world. It was also the organization responsible for the recent and radical revision of the International List of Causes of Death and one of its commissions drew up an international pharmacopoeia. It has committees now working in the fields of mental, maternal, and child health. With headquarters in Geneva, regional offices in New Delhi, Alexandria, Hong Kong (temporary office), and

Washington, and an epidemiological intelligence station in Singapore, the World Health Organization can truly be considered a worldwide public health agency.

8. How does the United States rank among the nations of the world in public health work?

International comparisons of public health are possible only in the most general terms. Only a few countries of the world are known to provide health services anywhere near the level of modern standards. They are the English-speaking nations, the Scandinavian countries, The Netherlands, Finland, and a few of the other European nations. Not too much is known today about public health work in Russia and the Eastern European countries. Elsewhere health protection is generally a privilege of the few; it is more a private than a public concern.

Even among the few nations with modern public health movements, satisfactory comparisons cannot be made because the approach to this work varies from country to country; one may do outstandingly well in a certain field and lag behind in another. If mortality and expectation of life reflect the level of public health work, the United States ranks near the top of the list. Certainly it is among the best in sanitation, communicable disease control, standards of technical training, and of medical and hospital service.

9. How much is spent for governmental public health work in this country?

In 1948, a total of $712,000,000 was spent by the states for community health protection. If one adds public health expenditures by federal and local government agencies, the figure is raised to more than two billion dollars.

10. Is there much geographic variation in public health expenditures?

Some states spend more than three times as much per capita as others on public health work and state hospitals and institutions. The expenditures are not necessarily greatest where mortality is lowest and longevity is highest. Some of the states spending large sums may do so because the need is great; it may take a long time to reduce mortality and increase longevity.

As the table on page 369 shows, in 1946 the New England and

Middle Atlantic states had the highest per capita health expenditures by state governments and the East South Central the lowest. The West North Central region, which has the best longevity record, ranked well below the national average in state health spending.

Per Capita Expenditures by State Governments for Health, Hospitals, and Institutions for the Handicapped, Fiscal Year, 1946

Region	Amount per Capita of Population
United States	$3.20
New England	4.84
Middle Atlantic	4.21
Mountain	3.22
East North Central	3.14
South Atlantic	2.90
West North Central	2.88
West South Central	2.67
Pacific	2.53
East South Central	2.06

11. What has been the trend in public health expenditures in recent years?

There has been a phenomenal increase of interest in public health in the last few decades and consequently a rapid rise in the funds spent for public health activities. In 1915, the Public Health Service received an appropriation of about $3,000,000. The budget for the same agency for the fiscal year ending in 1951 is about $290,000,000. State government expenditures for health activities, aid to local health agencies, and health facilities, have risen almost as remarkably. In 1915 they totaled $61,000,000; in 1948, $712,000,000. Local expenditures have undoubtedly also gone up sharply. The expansion of health services is still proceeding, and expenditures in the future are likely to continue to grow.

12. What is the United States Public Health Service?

From an agency established in 1798 to provide hospitalization for seamen, the United States Public Health Service has grown to be the largest single organization in this country in the field of public health.

Its public health work began toward the end of the nineteenth century when the federal government took over the responsibility for foreign and interstate quarantine in order to combat cholera, yellow fever, smallpox, and plague, which were continually being reintroduced into this country by travelers and ships. In 1902, the service established its laboratory to study infectious diseases.

Today the Public Health Service acts as a correlating and research agency for the nation's public health bodies. It operates the National Institutes of Health, conducts pilot studies in public health procedures, makes financial grants to states for health service and hospital construction, loans technical personnel and equipment, works on health education, and collects and publishes statistics on health and vital information. It also operates the marine hospitals for seamen and other hospitals for drug addicts, lepers, and some additional groups.

13. What are the National Institutes of Health?

The National Institutes of Health are the research bureaus of the United States Public Health Service. They are composed of seven separate, cooperating institutes:

National Cancer Institute
National Heart Institute
National Institute of Dental Research
Microbiological Institute
National Institute of Mental Health
National Institute on Arthritis, Rheumatism and Metabolic Diseases
National Institute on Neurological Diseases and Blindness

The institutes foster and conduct basic and applied research in their respective fields. The Microbiological Institute's program, for example, is focused on the viruses, bacteria and other micro-organisms which produce disease in man. It also administers the Biologics Control Law, setting standards for vaccines, serums and toxoids used in curative and preventive medicine. The institutes operate laboratories and stations in various sections of the country. In addition, they administer the federal grants for research and teaching fellowships to private individuals and institutions. A large clinical and research center for the institutes is now being completed at Bethesda, Maryland, not far from Washington.[1]

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[1] See answer to Question 41 of Chapter XII, page 190.

14. How is the responsibility for public health work divided among the federal, state, and local governments?

In most cases the local government (municipal, township, or county) carries out the greater part of our public health work. It deals directly with the public and normally does most of the necessary inspecting, supervising, collecting of reports, and the direct work with the sick.

The responsibility for public health work, however, legally rests in the state governments. In most cases, states aid the local agencies, both with funds and with actual services. In addition, the state officials are usually the ones to distribute federal grants to local authorities. In most states, the standards for health and sanitation are written into state law or state health department regulations; where local agencies fail to meet them, the state may take action. Also, the state health departments act in emergencies, supplying funds, personnel, and facilities.

The federal government's responsibility for public health is confined, in the law, largely to interstate and international matters. The federal government also does basic research in many fields of public health and suggests overall policy. Through its financial grants, the federal government can encourage the states to expand their activities. However, it cannot force state authorities to meet federal standards if they do not wish to use federal funds.

15. What is the role of voluntary agencies in public health work?

The voluntary agencies play an important role in public health work in the United States because they can and do act in fields not yet entered by government agencies. Practically the whole public health movement in this country is the result of pioneer voluntary work of this kind. Besides the professional and technical societies, which set standards and study needs, there are many associations devoted to specific diseases (tuberculosis, cancer, heart disease, diabetes, the venereal diseases, and poliomyelitis are the better-known ones) and a great many endowed foundations which devote all or a good part of their annual expenditures to work in the field of health.

The primary nongovernment agencies in public health, aside from those concerned with one special ailment, are the American Medical

Association, the American Public Health Association, the American Red Cross, the National Health Council, the National Organization for Public Health Nursing, and a number of smaller agencies.

16. What are health councils?

Health councils are organizations which bring together local health officials and representatives of a community's voluntary organizations interested in public health. Councils have usually no operating functions but correlate the activities of member organizations and official agencies and help to interpret the work to the public. They are also active in health education to awaken the public to the need for full-time technically trained health personnel and for various specialized health services. There are today about 1,200 local health councils in the country, under the leadership of the coordinating National Health Council in New York.

17. How many full-time local health departments are there in the United States?

In 1948, there were 1,266 full-time public health departments operating in counties and cities of the country. A full-time department is one under the direction of a health officer employed on a full-time basis. If the health officer works part-time, the department is not considered full-time even though clerks or other personnel may be on a full-time basis.

Minimum standards for the staffing of local health units have been suggested by a committee of the American Public Health Association. They are: one public health physician as administrator for every 50,000 persons or for every local health unit; one public health nurse for every 5,000 persons; one sanitation personnel for every 15,000 persons; and one clerk for every 15,000 persons. Few of the local health administrations in the country meet these standards. Although over 70 percent of the population lived within the jurisdictions of full-time local health departments in 1948, less than 5 percent were served by units coming up to the A.P.H.A. recommendations.

Those not living within the areas covered by full-time local health departments usually have a part-time local health agency or are served in some fashion by state authorities. A survey conducted in 1942 showed only about 7 percent of the population without any reported local health protection.

18. Who handles public health work in rural areas?

Outside of cities, public health work is usually handled by county organizations or by health district administrations covering more than one county. The number of combined health districts in 1948 was 261, covering 659 counties, or an average of about two and a half counties each.

19. What is the minimum number of full-time health departments needed to care for the American population?

It has been estimated by a committee of the American Public Health Association that no more full-time health departments are needed than are at present in operation, but that the distribution should be changed. In rural sections, instead of having the jurisdiction of most health agencies correspond to political boundaries (townships, counties, and so forth), it was suggested that there be one health unit for approximately every 50,000 persons, combining counties, towns, or townships if necessary into a single health district. On this basis, it is said that about 1,200 full-time health departments could cover the entire population. The combined health district idea has already been spreading. In 1935, there were only 50 such districts in the country while in 1948 there were considerably more than five times that number.

20. How many states have complete coverage by full-time health departments?

In 1942, only the District of Columbia and four states—Alabama, Maryland, New Mexico, and South Carolina—had a complete system of local full-time health agencies. New York had a district setup providing fairly complete local coverage. One state, Vermont, had no full-time local health departments. In the other states, the proportion of population covered by full-time health service ranged from 6 percent to more than 90 percent. The ten states with the least full-time health service were largely rural and located in the northern and western parts of the country.

21. How has the improvement in sanitation and water supplies helped to combat typhoid and other diseases?

In 1900, more than 35,000 persons died in the United States from typhoid fever. Dysentery, and diarrhea and enteritis took additional tolls. Stream pollution was already a serious problem and the contamination of water supplies was common. Today, despite the increase in pollution from sewage and industrial wastes, the contamination of water supplies has been cut down to a safe level in most areas by the use of chlorination, filtration, and other engineering developments. Sewage and waste disposal is handled by plants and equipment costing many millions. The results are impressive. In 1948, there were only 233 deaths from typhoid and paratyphoid; the death rate was less than one-hundredth of what it had been a half century before.

22. Is a city legally responsible for water-borne disease contracted from its water?

Since 1910 the courts have made cities pay damages for typhoid contracted because of negligence in the operation of water systems. The first instance was a case of typhoid in Minnesota, but there have been several in other states. In California, a city water chlorination plant was shut down for 12 hours, resulting in 19 cases of typhoid and dysentery. By 1928 the responsibility of a city for its water supply was so well established that when 248 persons came down with typhoid in Olean, New York, the city voluntarily paid damages to avoid suit.

23. What businesses and professions connected with health require special licenses?

In addition to persons engaged in the healing arts (chiefly physicians, dentists, nurses, osteopaths, chiropractors, optometrists, pharmacists, and dental hygienists) many others are required in some or all states to obtain licenses. Among them are embalmers, funeral directors, midwives, plumbers, operators of swimming pools and of water supply and sewage treatment plants, barbers, beauticians, and food handlers. Restaurants, hotels, hospitals, nursing homes and similar health establishments are also usually licensed.

24. How is the public protected from harmful foods, drugs, and cosmetics?

The federal, state, and local governments take part in food, drug, and cosmetic control. The responsibility of the federal government is restricted to goods in interstate commerce. Inspection for contamination, adulteration or improper labeling is handled by the Food and Drug Administration. The Federal Trade Commission is authorized to see that advertising claims for foods, drugs, and cosmetics in interstate commerce are correct.

Control of goods in intrastate trade is a state and local affair, usually administered by the health or agriculture departments. All states have laws or regulations covering food, drugs, and cosmetics, but there is a great deal of variation in the requirements and enforcement. The food which generally receives the most attention is milk. Most states inspect dairies and rigidly regulate the handling and marketing of milk. Dairy and meat products, bakery goods, and confections are also usually inspected, but the detection of defects in these is much more difficult. For example, meat containing the organisms which cause trichinosis shows no visible signs of contamination and might easily be passed by inspectors. The only guarantee against that disease is proper cooking.

In many states food handlers are examined and licensed. Here again the usefulness of the regulations is often questioned, since few individuals receive the kind of thorough medical examination necessary to determine if they are carriers of some of the less obvious diseases.

25. How are the sales of narcotics controlled?

Narcotics control is handled chiefly by the federal government. Since this control is legally founded on the power to tax, enforcement of the laws and regulations is undertaken by the Treasury Department. Only registered and licensed persons in a few fields (primarily in medicine and in the drug industry) may deal in narcotics. Drug companies and druggists are inspected at intervals, and individuals, ships, trucks, aircraft, coming into the country are also watched. To supplement federal regulations, many states have their own rules.

26. What communicable diseases must be reported to public authorities, and who is responsible for the reporting?

The list of diseases varies from state to state, but more than 100 are supposed to be reported in one state or another. The table below includes those for which the federal Public Health Service collects figures. In general, they are communicable diseases which are or were once considered to be a threat to public health. Ordinarily the attending doctor is required to report the case, but if no doctor is called in, a nurse, the household head, or some other person must make the report in some states. The more serious diseases are likely to be reported promptly. Cases of plague and cholera (which are not on the list because of their present rarity) are unlikely to go unnoticed. Reporting of such common diseases as influenza and pneumonia, however, is very poor.

Notifiable Diseases on Which the Federal Public Health Service Collects Weekly Figures

Anthrax
Chickenpox
Conjunctivitis
Diphtheria
Dysentery (amoebic)
    (bacillary)
    (undetermined)
Encephalitis (infectious)
German measles
Hookworm disease
Influenza
Malaria
Measles
Meningitis (meningococcus)
Mumps
Ophthalmia (neonatorum)
Pellagra
Pneumonia (all forms)
Poliomyelitis
Rabies in man
Rheumatic fever
Rocky Mountain spotted fever
Scarlet fever
Septic sore throat
Smallpox
Tetanus
Trachoma
Trichinosis
Tuberculosis (all forms)
    (respiratory)
Tularemia
Typhoid fever
Paratyphoid fever
Typhus fever (endemic)
Undulant fever
Vincent's infection
Whooping cough

27. What action is taken by public health authorities when a case of a communicable disease is reported?

If the disease is serious, the local health department, while reporting the case to the state and perhaps to the federal government, will investigate. A doctor is often sent to verify the diagnosis and sometimes a public health nurse to help in caring for the patient. The family and other persons who have been in contact with the patient may be quarantined, and the sick person is frequently isolated.

If the disease is one which is likely to spread unless its source is removed, an epidemiologist is assigned to trace the origin of the infection. Depending on the ailment, it may turn out to be a human carrier, contaminated water or food, or an insect or animal host. In cases of diseases like typhoid, smallpox, yellow fever, dysentery, cholera, and plague, it is vitally important to locate the source before an epidemic can get started. If the danger seems acute, the local health department may even recommend immunization of the local population and sometimes supply free vaccine.

28. Is quarantining of exposed persons necessary in many infectious diseases?

Formerly quarantine was often used as a preventive measure. However, with greater medical knowledge of the way in which diseases are spread, public health authorities have reduced the number of diseases requiring quarantine. Isolation of the patient is still important and is common practice in most localities for about 30 relatively well known types of infection. Although the regulations are not uniform throughout the country, many public health agencies insist on quarantining the family or close contacts of the patient in cases of the following diseases:

Cholera
Diphtheria
Infant diarrhea (quarantine of nursery)
Paratyphoid fever
Whooping cough (quarantine from nonimmune children)
Plague
Psittacosis (quarantine of birds, not people)
Rabies (quarantine of biting or bitten animals)
Typhus (quarantine of people, if they have lice)
Smallpox
Scarlet fever (this is sometimes a local regulation)
Typhoid fever

29. How do epidemiologists work to protect public health?

There are many examples of what epidemiologists do in tracing the source of dangerous infections and in discovering those exposed to disease. Perhaps the most famous recent cases have been the smallpox scares in this country since the war. In New York City, a man died of a serious rash in a city hospital in February, 1947. A few weeks later his case was diagnosed as having been smallpox, and then three more cases were found. The source of the infection was traced to Mexico City, and as many as possible of those in this country who had had contact with the first or later cases were found in order that they might be vaccinated. At the same time, other localities became involved because the first victim had traveled through many of them. Mass vaccinations were finally instituted and the outbreak stopped after 12 cases and two deaths occurred. The states of Washington and California also had outbreaks of smallpox at the end of the war. From there, the disease was traced to Japan, where some soldiers had contracted it and brought it to this country.

Although there have been cases of smallpox, typhoid, and even cholera and plague in this country in the last half century, the outbreaks have always been confined to a relatively small area.

30. Do all states have public health laboratories?

In all states there is some sort of public health laboratory. The work undertaken by the laboratories varies, but there are some standard services which are normally provided. First of all, there are the tests for various diseases, such as blood tests, sputum tests, and so forth. Health laboratories also usually test drinking water, milk, food, drugs, and samples taken in connection with industrial surveys. In some states, the laboratories manufacture the biological products (serums, vaccines, and toxoids) for the prevention of certain communicable diseases and distribute them free.

31. Do most health departments have tuberculosis, venereal disease, and cancer services?

In 1948, there were 46 states with state-wide programs for tuberculosis and venereal disease control and for cancer services. In 1947, there were 1,325 tuberculosis diagnostic clinics (including voluntary as well as government-operated ones) and 831 voluntary and official clinics for lung-collapse therapy for tuberculosis patients not in sanatoria. In addition, there were many local mass X-ray case-finding drives for tuberculosis.

There were 2,328 venereal disease clinics in the country in 1947, generally under the jurisdiction of health officers. In 1950, the country had 10 cancer hospitals and 449 clinics, and 129 cancer detection centers that were approved by the College of Surgeons. The majority of the cancer clinics were operated by voluntary health organizations.[2]

32. To what extent is maternal and child health cared for by public health agencies?

Maternal and child health programs have been growing steadily in this country. Under the Social Security Act, $18,500,000 was spent by the federal government in 1946 for maternal and child health services, and another $71,000,000 on lunches for school children. There are maternal and child health programs in all 48 states and the District of Columbia. State aid for prenatal and postnatal care of mothers is regularly provided in many states. Home nursing service for mothers is given in practically all states and the District.

All but a few states help local authorities to assure either hospital delivery of babies or delivery by a doctor at home. Either clinic or home nursing care for infants and preschool children is a standard service in all states and the District.

School children also are given medical examinations. In all but one state there are regular arrangements made by the state authorities to follow up cases involving any health defect.

A total of 2,182 maternity, 4,237 well-child, and 988 pediatric clinics were in operation in the country in 1947; about three-fifths of them were run by health departments.

33. What are the functions of public health nursing, and how many public health nurses do we have in the United States?

Public health nurses form one of the most important groups in health work. They are active in health education, in maternal and child health services, in home care for the sick, in communicable disease control, and, in fact, in almost all of the important preventive and curative functions of health departments. In rural areas, the burden of public health work is often carried by the nurses.

In 1950, there were 25,081 public health nurses in the country, almost two-thirds of them working in urban centers and the remaining one-third in rural areas. Unfortunately, there still were 715 counties (out of 3,070) and 18 cities lacking public health nursing service.

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[2] See answer to Question 41 of Chapter IX, page 142.

34. Do many public health departments operate mental hygiene clinics?

There were 628 mental hygiene clinics in the United States in 1947, but only 129 of them were operated by health departments. The rest were under the control of other government bodies- -in many cases the state mental hygiene or hospital services—or of private agencies.

35. Do many health departments provide dental service?

Dental care lags behind many other health services in this country. In a survey of health work shortly before World War II, the Public Health Service found that only half of the state health organizations actually rendered some dental service. Most of the others had educational campaigns on dental care, but they did not aid in the operation of clinics. Of those which did have some dental care activities, a great many attempted only demonstration work, without provision for help to large numbers of people. Most of the dental clinics and examination services run by states were for children rather than adults.

36. To what extent do health departments provide for general medical care?

Medical care for special patients is provided by a great many health agencies. The federal government, for example, cares for drug addicts, certain mental patients, for servicemen, seamen, and for veterans. Practically all levels of government provide medical care for prisoners under their supervision or for other institutionalized persons. Many state and local health agencies have budgets for medical care for patients suffering from certain specific conditions such as venereal disease, tuberculosis, mental illness, or cancer. General medical care is supplied by relatively few full-time local health departments—less than one-tenth of those covered, according to one survey. Out of 690 departments reporting, only 66 had any kind of general medical care program; the proportion of departments offering such services was higher for the larger cities than for the smaller ones. Almost without exception, these services were meant only for the needy. Maryland had a state-wide system of medical care provided by full-time local health departments.

37. What is the role of health departments in the collection of vital statistics?

Birth and death certificates are usually collected by local health authorities and passed on, in original or transcript form, to the state health departments or boards. From there, copies of the certificates go to the National Office of Vital Statistics of the federal Public Health Service, where pertinent facts are abstracted and tabulated for statistical purposes. The annual collection of vital statistics on a uniform basis for the whole nation is quite recent. This annual collection began in 1900, when the Death Registration Area, containing ten states and a number of cities including the District of Columbia where the records were deemed sufficiently accurate, was formed by the federal government for this purpose. Additional states were taken into the Death Registration Area when their records were considered sufficiently accurate. A corresponding system of birth registration was started in 1915. The last state to join the two systems was Texas in 1933.

Marriage and divorce figures are also handled by health authorities of the state in many cases, although the original information comes in most instances from county or city clerks and from law courts. About three-quarters of the states require reporting of marriages to central state authorities and about three-fifths require reporting of divorces, but these laws and regulations are not always enforced.

38. In how many states is smallpox vaccination compulsory?

There is little agreement among states on smallpox vaccinations. In most, vaccination is not mandatory, and in some it may be required only when the health officer decides it is necessary for the public welfare or when there is a threat of a smallpox epidemic. In 1941, there were only six states without any regulations at all concerning vaccination.

Seventeen states had laws relating to the vaccination of the general population in 1941. Only two of them, however, made vaccination invariably compulsory. Vaccination was a prerequisite for school attendance in 21 states, but with many special conditions, including local option in some states. In others, the opposition of the parents to vaccination exempted a child.

39. In how many states are premarital and prenatal examinations required? [3]

Prenatal blood tests of the mother to detect syphilis that, if untreated, might be transmitted to the child, are required in 42 states. Alabama, Maryland, Minnesota, Mississippi, Tennesssee, Wisconsin, and the District of Columbia do not have such laws.

40. How many public hospitals are there in the United States? [4]

There were 1,912 hospitals controlled or operated by government at all levels in the country in 1950, and they had over 70 percent of the total bed capacity of all the nation's hospitals. Nongovernmental hospitals totaled 4,518, more than two-thirds of which were financed by churches or other nonprofit groups. The private hospitals, although more numerous, are on the whole smaller than the government institutions. Most of the nonprofit hospitals and many of those owned individually or by partnerships or corporations have wards or beds which are free or for which only a nominal charge is made.

41. How is the federal government aiding in the construction of new hospitals?

A year after World War II ended, Congress passed a law to aid states in surveying their hospital needs and in constructing new hospitals. Originally $75,000,000 of federal funds a year were made available for building new hospitals, outpatient clinics, public health centers, and other related facilities; the states or local authorities were required to contribute two dollars for every federal dollar they accepted. In 1949, the act was changed, permitting the federal government to contribute in certain instances more than one-third of the cost of individual projects. More than 200 projects have already been completed and about 800 are in course of construction. Over two-thirds of these new developments are located in communities of fewer than 5,000 people, most of which have been without adequate general hospital facilities. These new projects will add about 65,000 hospital beds of all types.[5]

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[3] See answer to Question 11 of Chapter III for premarital tests, page 35.

[4] See answer to Question 35 of Chapter VI, page 89.

42. How does the government keep disease from being imported into this country?

The federal government has quarantine jurisdiction over incoming vehicles (ships, airplanes, etc.). Some of the diseases which are watched for are cholera, yellow fever, typhus fever, smallpox, leprosy, plague, and anthrax. Ships and airplanes and their crews and passengers are the main concern. In addition to medical officers overseas and to international reporting of many of these diseases, incoming craft are inspected at the port of entry and quarantined if necessary. Plants and animals are also inspected in order to exclude plant blights and animal infections.

All immigrants are also now required to undergo medical examinations in the countries where they get their visas. Public Health Service medical officers are detailed overseas to make the examinations. Excludable groups include: the feeble-minded and the insane, epileptics, the tuberculous and those afflicted with "a loathsome or dangerous contagious disease." In addition, doctors are not to certify for admission persons who have any mental or physical defect which might interfere with their ability to earn a living.

43. What kinds of specialized personnel are needed by an up-to-date health department?

The key person in public health work is, of course, the health officer. The training usually required for that job includes not only a medical degree but also postgraduate work in the special field of public health. Sanitation personnel, public health nurses, and a clerical staff are also necessary. In the public health departments of some states and of large cities and populous counties there may also be a need for other specialized workers: for example, water works engineers, many kinds of medical specialists, psychologists, dentists, laboratory technicians, health educators, nutritionists, and medical social workers.

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[5] See answer to Question 39 of Chapter VI, page 91.

44. Is there enough technical public health personnel in the country?

To meet the standards suggested by the American Public Health Association, there were needed in 1946 an additional 19,000 public health nurses in local health departments and an additional 2,000 to 4,000 sanitarians. The number of additional physicians required for full-time local health work was in the neighborhood of 1,500. The need for other technical personnel has not been surveyed, but the shortage is known to be great.

45. How many schools of public health are there in the country and how many persons can they train?

There are 11 universities in the United States and Canada accredited by the American Public Health Association to confer degrees or diplomas in Public Health. They are the University of California at Berkeley, Columbia, Harvard, Johns Hopkins, Michigan, Minnesota, North Carolina, Pittsburgh, Toronto, Tulane, and Yale. In the academic year of 1948–49, 915 students were enrolled in graduate public health work, and 575 received degrees or diplomas at the end of the school year.

46. What are some of the more recent developments in public health work?

The two most important recent developments are in the fields of chronic disease control and general medical care. With the success of the older health activities, there has come a drop in mortality at the younger ages and a shift in the importance of causes of death. The diseases which take the largest tolls today are no longer the acute infections but the chronic conditions. Two of the most important of these—heart disease and cancer—are not communicable and cannot be controlled by immunization or epidemiological work. Their onset is difficult to diagnose and their damage has too often been done before they are noticed. In recognition of the growing importance of chronic disease, the Massachusetts Department of Health and the State Medical Society, with the cooperation of some voluntary agencies, have worked out a modern health protection program. A clinic has been opened where persons who are apparently healthy can have tests made without charge to detect diseases before serious or irreversible changes have taken place.

Gradually, public health departments are taking more responsibility for supplying medical care to those families who cannot afford it. Medical care of some kind for certain indigent groups is provided by about half of the states. Those aided are chiefly needy aged, the blind, and dependent children. Many local health departments have the same kind of service without any state-wide regulation.

XXIV

HOW LONG WE LIVE

1. What is meant by the "life span" and by the "average length of life"?

The life span is the greatest number of years that a human being can live. What this biological limit to life may be is not known precisely, but we do know that relatively few persons survive more than 100 years. It is unlikely that man has experienced any increase in his life span over the centuries.

The average length of life is the average number of years lived per person in a group of people traced from birth to the death of the last survivor. Although the life span is probably unchanged, the average length of life has increased greatly in modern times as a larger proportion of people have survived to the higher ages.

2. Are there many authentic cases of persons who have lived to be 100?

Cases of extreme old age are usually reported where illiteracy is frequent and where record-keeping is notoriously poor—in other words, where the facts cannot be verified. Since official registration of births is a relatively modern development, authenticated cases of old age are hard to find. An English actuary who searched British insurance and annuity files found only 30 acceptable cases of centenarians among 800,000 lives. In Canada there is an authenticated instance of a man who lived 113 years and 124 days. Another frequently cited case is that of a Dane, Christen Jacobsen Drakenberg, who was born in 1626 and supposedly lived for 146 years.

3. What is the average length of life in the United States?

In 1950, the average length of life in this country was 68 years, an increase of about 28 years since the middle of the nineteenth century. From 1850 to 1900, the average length of life in the United States rose by about nine years. Since the turn of the century the advance has been accelerated, and the gain has totaled 19 years.

4. What was the average length of life in the United States when the country was founded?

According to a table prepared from death records in Massachusetts and New Hampshire for a period ending in 1789, the average length of life was then 35.5 years. The recent figures for white females in the United States are just double this.

5. How does the average length of life in the United States compare with that in other countries?

In only a few countries—Australia, New Zealand, Norway, Sweden, Denmark, and The Netherlands—is the average length of life greater than in the United States. The best recent records are found in New Zealand and in The Netherlands, where the expectation of life at birth is about two years greater than for the United States. However, there are many states that have a record even better than some of the countries that exceed the national average.

Figures for the average length of life or expectation of life at birth in many countries may be compared in the table on the next page. India had the poorest record of longevity of any nation for which data are available. There, the expectation of life at birth in 1921–31 was only about 27 years, less than half that for the United States about the same time, and not much better than the level in ancient Rome.

A rather close relation has been found between expectation of life and the plane of living among the countries of the world. Life is short and death rates are generally high in those areas where the average daily per capita caloric consumption is low.

6. What is the average length of life for the world as a whole?

The only estimate made relates to the pre-World War II situation, when the average length of life was placed at about 35 years.

Expectation of Life at Birth in Several Countries

Country; Period	Expectation of life at birth, years		Country; Period	Expectation of life at birth, years	
	Males	Females		Males	Females
Australia			Mexico		
1946–48	66.1	70.6	1930	32.4	34.1
Belgium			Netherlands		
1928–32	56.0	59.8	1947–49	69.4	71.5
Bulgaria			New Zealand		
1925–28	45.9	46.6	1947	67.8	71.6
Canada			Norway		
1947	65.2	69.1	1921–31	61.0	63.8
Chile			Poland		
1939–42	40.7	43.1	1931–32	48.2	51.4
Czechoslovakia			Portugal		
1929–32	51.9	55.2	1939–42	48.6	52.8
Denmark			Russia (Europe)		
1941–45	65.6	67.7	1926–27	41.9	46.8
Egypt			Scotland		
1936–38	35.7	41.5	1930–32	56.0	59.5
England and Wales			Spain		
1841	40.2	42.2	1930–31	48.7	51.9
1901–10	48.5	52.4	Sweden		
1946–48	65.3	70.0	1755–76	33.2	35.7
Finland			1901–10	54.5	57.0
1941–45	54.6	61.1	1936–40	64.3	66.9
France			Switzerland		
1947	62.8	67.7	1939–44	62.7	67.0
Germany			Union of South Africa		
1932–34	59.9	62.8	(Whites) 1940	61.5	66.1
Greece			(Nonwhites)		
1928	49.1	50.9	1935–37	40.2	40.9
Hungary			United States (White)		
1941	54.9	58.2	1789 (Mass., N.H.)	35.5*	—
Iceland			1850 (Md.)	41.8	44.9
1931–40	60.9	65.6	1900–02	48.2	51.1
India			1919–21	56.3	58.5
1921–31	26.9	26.6	1929–31	59.1	62.7
Ireland			1939–41	62.8	67.3
1940–42	59.0	61.0	1948	65.5	71.0
Ireland, Northern			(Nonwhites)		
1936–38	57.8	59.2	1929–31	47.6	49.5
Italy			1939–41	52.3	55.6
1930–32	53.8	56.0	1948	58.1	62.5
Japan			Venezuela		
1949–50	56.2	59.6	1941–42	45.8	47.6

* Total persons.

7. Are there signs that longevity increased in ancient times?

The average length of life of prehistoric man has been estimated at about 18 years. Judging from the many skulls found with marks of blows, violence was the usual cause of death. Very few fossils show survivorship beyond age 40 in prehistoric times. Estimates of the average age at death made from Greek skulls for the period 3,500 B.C. to 1,300 A.D. suggest a small rise in longevity over those centuries.

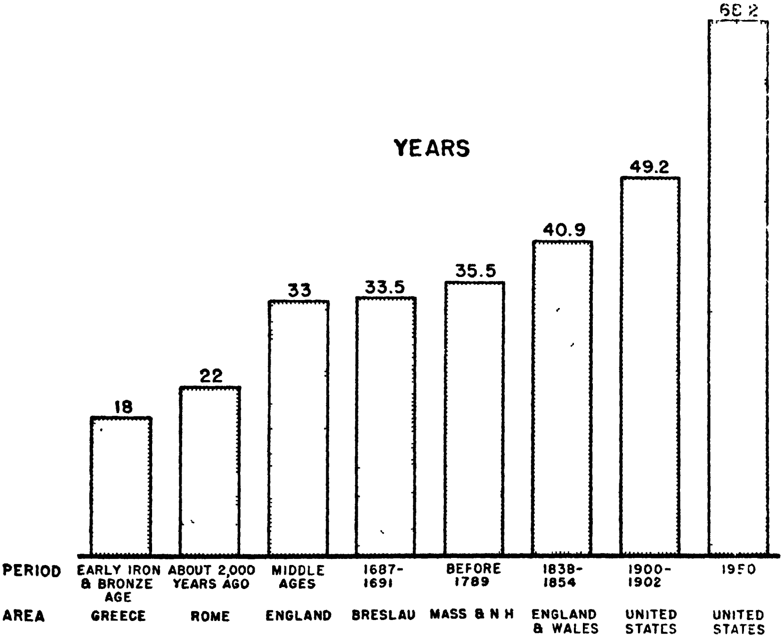

Chart 19. Average length of life from ancient to modern times.

The bones from the period when civilization was rising in Greece show evidence of better teeth, increased body size, and fewer arthritic conditions. At the same time, archaeological findings point to improvements in nutrition and in the general conditions of life. During those years there was also a growth of medical skill in Greece. Burial inscriptions for the time of the Roman Empire indicate that the average length of life may then have been between 20 and 30 years. (See Chart 19.)

8. What gains in longevity were made up to the beginning of the modern public health era?

During the Middle Ages, the average length of life in England may have been near 33 years. Another estimate, based on records of the ruling classes of Europe during the Renaissance, is 30 years. From death records in Breslau for 1687–91, the English astronomer, Edmund Halley, arrived at an average length of life of 33½ years. In Massachusetts and New Hampshire in the late eighteenth century the average was about 35½ years, according to a report published by Wigglesworth in 1793. There was, therefore, only a slow and rather insignificant rise in longevity in the many centuries from the time of the Roman Empire to the American Revolution. However, in the subsequent period up to 1850, the average length of life in English-speaking countries went up by five years. In the century after that, the rate of improvement was greatly increased.

9. What social and scientific influences have brought about the progress in longevity within the last century?

Basically, the rapid gains in longevity during the last century—from an average length of life of 40 years for the United States in 1850 to 68 years in 1950—were made possible by the great industrial and agricultural progress in the Western world. An integral part of this progress has been the great advance in sanitary practices and the wide expansion of medical knowledge. The first modern efforts at public health reform, which started with the English social reforms of little more than a century ago, were devoted to the pressing problems of local sanitation and housing. Out of this movement developed the modern codes of law designed to protect the quality of food, the supply of water, and the work and home environment.

With the discovery of the infectious nature of many diseases, it became possible for community leaders to take effective steps for their virtual eradication. These efforts have had their greatest success against smallpox, cholera, yellow fever, typhoid fever, diarrhea and enteritis, diphtheria, scarlet fever, whooping cough, measles, and tuberculosis.

Modern developments in medicine have been along many lines. The skill of the surgeon has been greatly increased. Vaccinations and inoculations to prevent infections are common practice. The use of insulin—a hormone—has greatly altered the outlook for diabetics; more recent discoveries regarding hormones give great promise for relief from some of the most common ailments, like the rheumatic conditions. The role in disease played by nutritional deficiencies has become a study by itself; the outstanding development here is the discovery of the vitamins. The X-ray has become an important tool in diagnosis and treatment. Physiotherapy, in its various phases, has taken a prominent place in treatment and rehabilitation. In addition to the beneficial effects presently offered by radiotherapy, new fields of research have been opened by the use of radioactive tracers in physiological processes. Recent advances in chemotherapy and the antibiotics have already produced spectacular reductions in mortality, notably from pneumonia, appendicitis, syphilis, and the puerperal infections; certain forms of tuberculosis have also responded favorably to such treatment.

The recent rapid rise in the general conditions of life has contributed much to our better health status. Shortened hours of labor now provide greater opportunity for leisure; food is more varied, more abundant, and of better quality; personal cleanliness has been greatly improved; and homes are now roomier and designed for more air and sunlight. Safety measures in the factory, the home, and in public places have saved countless lives from premature death.[1]

10. What is the outlook for further gains in longevity?

Existing knowledge in medicine and public health will continue to be applied more widely and also more intensively. At the same time, there will undoubtedly be further advances in medical knowledge. And finally, the standard of living may be expected to keep on rising. Together, these forces will certainly reduce mortality and lengthen life. It is very likely that the average length of life in the United States will exceed 70 years before 1960.

11. Are we sufficiently optimistic regarding prospects for improved longevity?

A number of life tables have been constructed for the purpose of gauging the gains in longevity that might be expected if full advantage were taken of the latest advances in medical and public health development. Notwithstanding the optimistic view taken when these tables were prepared, experience has shown that it does not take long before an even more favorable situation actually develops. For example, a life table of this kind prepared in 1922 showed an expectation of life at birth of 64.75 years; this was practically duplicated in a life table based upon the experience of white females in the United States during 1930–39. Another such hypothetical table constructed in 1941 had an expectation of life at birth of 70.8 years, which was excelled by the figure of 71 years experienced by white females in 1948. In other words, experience has shown that our optimistic views regarding prospects for improved longevity are generally conservative.

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[1] See answer to Question 22 of Chapter VII, page 102.

12. What is a life table?

The life table is a table of figures that shows how many, out of a group of people followed from birth, survive from one year of age to the next. From these figures is computed the expectation of life which, at birth, is the average length of life. An example of a life table is shown on page 393. The life table is generally based upon the death rates at each age of life as observed in a community during some period. In the example, the figures in column 2 show the chances of dying within the year of age following a birthday, according to the experience observed among white males in the United States during 1939–41.

The usual life table starts with a group of 100,000 persons at birth. The example shows their chance of death in the first year of life to be 48.12 per 1,000. Therefore, among the 100,000 births we start with, there will be 4,812 deaths in the first year of life, and 95,188 will be left to reach their first birthday.

In the year of age after their first birthday, the chances of death are 4.87 per 1,000 according to the example. The number of deaths within the year among the 95,188 survivors who reached age one is then

$$95{,}188 \times \frac{487}{1{,}000} = 464.$$

With this number of deaths within the year, the number surviving to their second birthday is $95{,}188 - 464 = 94{,}724$. Continuing with

Excerpt from Life Table for White Males in the United States: 1939–41

1	2	3	4	5
	Rate of Mortality per 1,000	Of 100,000 Born Alive		Complete expectation of life or average future lifetime; Average number of years lived after age x per person surviving to exact age x
Year of Age	Number dying between ages x and x + 1 among 1,000 living at age x	Number surviving to exact age x	Number dying between age x and x + 1	
x	$1{,}000q_x$	l_x	d_x	$\mathring{e}_x$
0	48.12	100,000	4,812	62.81
1	4.87	95,188	464	64.98
2	2.65	94,724	250	64.30
3	1.90	94,474	179	63.46
4	1.53	94,295	145	62.58
—	—	—	—	—
—	—	—	—	—
—	—	—	—	—
19	1.99	92,477	184	48.66
20	2.12	92,293	195	47.76
21	2.23	92,098	205	46.86
22	2.32	91,893	214	45.96
23	2.38	91,679	218	45.07
24	2.41	91,461	220	44.17
25	2.43	91,241	222	43.28
26	2.45	91,019	223	42.38
—	—	—	—	—
—	—	—	—	—
—	—	—	—	—
104	437.12	8	4	1.73
105	447.60	4	2	1.68
106	457.38	2	1	1.64
107	466.40	1	0	1.61
108	474.62	1	1	1.57

this procedure, it is a simple matter to arrive at the numbers surviving to successive ages.

13. What is meant by "expectation of life"?

The expectation of life is the average number of years remaining, per person, among a group of some stated age, assuming that they will thereafter experience the mortality rates of the life table. The expectation of life, therefore, shows the average remaining years on the assumption that the mortality rates of the life table will remain unchanged in the future.

14. How is the expectation of life measured?

The life table on page 393 will be used as an example. We start with the reasonable assumption that, on an average, one-half year of life is lived by each person in the age of his death. This means that, of the 92,293 of the life table who attain age 20, there were 195 who died after one-half year of life in that age, 205 who died one and one-half years after reaching age 20 years, 214 who died 2½ years after reaching age 20 years, and so on. Thus, the total years of life lived by the 92,293 after entering age 20 and until the last is accounted for by death comes to

$$195 \times \tfrac{1}{2} + 205 \times 1\tfrac{1}{2} + 214 \times 2\tfrac{1}{2} + \text{etc.} = 4{,}407{,}507 \text{ years of life.}$$

The average number of years of life lived after age 20 is then

$$4{,}407{,}507 \div 92{,}293 = 47.76 \text{ years.}$$

In like manner, it is possible to compute the average number of years remaining after any other age. Computed from birth, the figure yields the average length of life.

15. Is the average age at death a good measure of the longevity in a community?

The average age at death in a community is influenced strongly by the age composition of its population. In a new community, to which only the relatively young have migrated, the average age at death will necessarily be low. On the other hand, in an old community from which the young have migrated, the aged will form a larger proportion of the total population and so the average age at death will tend to be high. To measure the longevity in a community correctly, it is necessary to prepare a life table from death rates according to age; the answer is provided by the average length of life, or the expectation of life at birth, in this table.

16. Who prepared the first life table?

The earliest table on record is credited to the Roman Praetorian Praefect Ulpianus who lived in the middle of the third century A.D. Just how the table was drawn up or whether it actually gives expectations of life or annuity values is uncertain. In 1693, the English astronomer Edmund Halley published a life table based solely on birth and death records for Breslau. The average length of life indicated by Halley's table was 33.5 years. The first life table which took into account both the number of deaths and the population exposed to risk of death was computed by Milne from records for two parishes in Carlisle, England, covering 1779 to 1787.

17. Have life tables been prepared for species other than humans?

Life tables have been prepared for several species of insects, birds, and animals. They have also been used to find the average length of life of automobiles and such physical equipment as electric light bulbs and railroad ties.

18. What is the age at which a person may expect to live just as long again?

The 1948 life table for white males in the general population of the United States shows that at age 35 there is, on an average, another 35 years of life remaining. For white females, this age is 37⅖ years, for nonwhite males 32½ years, and for nonwhite females 34½ years. This halfway station in life, when the expectation of life is equal to the attained age, is somewhat variable, but much less so than the average length of life. With this halfway point at about 35 years, the average person may expect, according to averages, to live to age 70, which happens to be the oft-quoted biblical "three score years and ten." No doubt it is this figure that Dante had in mind in the opening lines of his Divine Comedy, where he refers to himself as halfway on the road of life. Writing this, supposedly in 1300, he was then 35 years old.

19. How have the chances of reaching school age, maturity, and old age increased since 1900?

At the beginning of the century only about 87½ percent of the babies born alive lived to their first birthday; today about 97 percent do so. Under conditions of 50 years ago, about 81 percent would survive to enter school at the age of 6, while under present conditions the figure is about 96 percent. Similarly, the proportion who would reach the voting age of 21 has risen from 77 to 95 percent. The proportion who would live to the usual retirement age of 65 years has gone up from 41 to 66 percent. The chances of living to ages 95 or 100 have not increased measurably. (See Chart 20.)

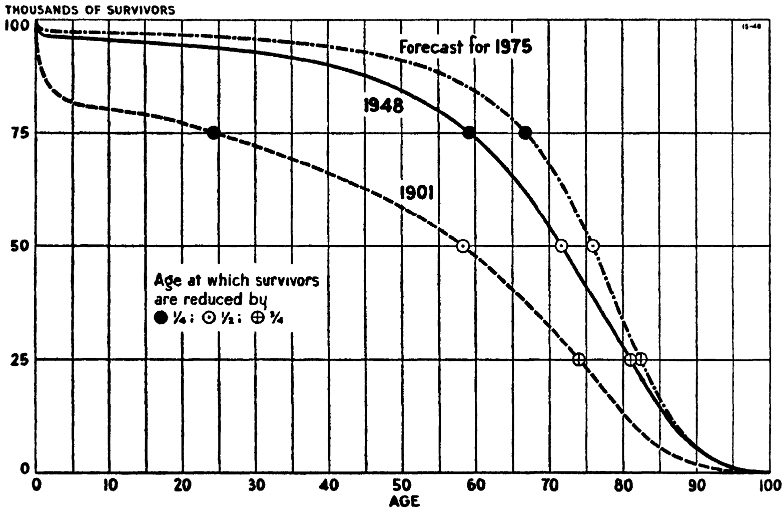

Chart 20. Survivors from birth to successive ages. According to life tables for the United States, 1901, 1948, and forecast for 1975 on the basis of "low" mortality.

20. How do the gains in expectation of life compare at different ages?

Most of the gain in expectation of life has been made under age 50 for white males and under age 60 for white females. For the colored, these gains extend into ages ten years higher. The situation among white males may be cited as an example. At age 60, the figure for 1948, namely 15.40 years, is only one year greater than that for 1900–1902. On the other hand, at age 50, there is a rise of 1⅗ years so far this century. At age 20, the increase amounts to 6¾ years, but at birth it comes to practically 17 years. These differences by age reflect the great progress made in reducing mortality from the infectious conditions, which took their greatest toll among children and young adults. However, it is noteworthy that there have also been some gains at the higher ages, even though they are small. The gains in later life are necessarily small because there has been little progress in controlling the diseases of old age.

21. How does the longevity of men compare with that of women and which has had the more rapid rise?

Not only do women have a greater expectation of life than men at all ages, but their gains in longevity have also been greater. As a result, their advantage over men has been growing. In 1900, the expectation of life at birth of white females was nearly three years more than that of white males, but in 1948 it was more than five years greater.

However, the difference in expectation of life between females and males declines at the later ages. While white girl babies have an expectation of life today more than five years greater than white boy babies, at the age of 60 white women have an expectation only about 2½ years greater than white men.

22. How does the longevity of the white and colored populations compare?

Although the longevity record of the colored is appreciably below that of the white population, the difference has steadily decreased. In 1948, the expectation of life at birth of colored males was 58.1 years, about seven and one-half years less than that of white males; for colored females it was 62.5, or eight and one-half years less than that of white females. About two decades earlier, in 1929–31, the corresponding differences were 11½ and 13⅙ years, respectively. While the average length of life of whites in this country has risen 7⅓ years since 1929–31, that of colored persons has gone up 11¾ years.

Nevertheless, the longevity of the colored today still lags about two decades behind that of the white population.

There is an interesting quirk in the longevity record for the colored after age 60. Probably because of many misstatements as to age, the computed figures for expectation of life for the colored at the higher ages are somewhat higher than for the whites; it is doubtful that this is actually the case.

23. How is the composition of our population being changed by the rise in longevity?

Every rise in longevity results in a higher average age of the population and an increasing proportion of older persons. Combined with a falling birth rate, the rise in longevity brings about an accelerated aging of the population.[2] The greater extension of the average length of life of women than of men will bring our population an increasing excess of females over males, particularly at the later ages. The immigration of large numbers of young men was once a factor in keeping the proportion of the aged at a low level, but this is no longer the case. With the more rapid gain in longevity of the colored and the reduction in immigration, which was mostly white, the proportion of our nonwhite population is also increasing.

24. How do the foreign-born and native populations compare in longevity?

At the beginning of the century the longevity of the foreign-born was decidedly less than that of the native population. At age 20, for example, foreign-born men in this country had an expectation of life two and one-half years less than native white men, and foreign-born women had three years less than native white women. By 1930, the differences were cut to about one year, and by 1940 they had just about disappeared.

25. How does the industrial population compare with the average of the country in longevity?

The best indication of the longevity of the industrial population is the experience of the millions of Industrial policyholders of the Metropolitan Life Insurance Company. In 1911–12, these policyholders had an expectation of life at birth of 46.6 years, about 6.5 years less than that of the country as a whole. Since then, the average length of life of this industrial group has risen faster than that of the general population, and by 1950 it was 68.2 years, practically the same as that of the country as a whole. The elimination of the gap in longevity between the industrial and the general population reflects the rapid rise in the standard of living of the people.

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[2] See answers to Questions 7 and 8 of Chapter XV, page 228.

26. Is the average length of life longer in rural areas than in cities?

Between large cities—those of 100,000 persons or more—and smaller urban centers there is little difference in longevity, according to the figures for 1939, the latest available. Rural areas, however, do show up considerably better than cities of any size. The expectation of life at birth for white males living in the country was two and one-half years greater than for those in cities; for white females in the country, it was one and one-quarter years greater than for those in cities.

27. Which states have the best record for average length of life?

The six leading states are Nebraska, South Dakota, Minnesota, Iowa, North Dakota, and Kansas. They lie in the West North Central section of the nation and are for the most part agricultural in character. Each of these states had, in the period 1939–41, an expectation of life at birth of more than 65 years for white males and of more than 69 years for white females. In contrast to Nebraska, the top state, where the expectation of life at birth of white males was 66.25 years, Arizona had a corresponding figure of only 56.83 years. Nebraska was also the top state for longevity of white females with a figure of 70.04; at the bottom of the list was New Mexico, with 60.96 years.

Most of the industrial states have longevity records somewhat better than the average for the country. The states of the South generally fall below the nation's average.

Not all factors which influence the longevity ranking of the states can be isolated. The states near the top of the list enjoy a relatively high standard of living. They also have a high level of public health administration and accessible medical and hospital facilities of high quality. On the other hand, Arizona and New Mexico at the other end of the list have large Spanish-speaking populations on a lower standard of living.

28. Is it possible to calculate the expectation of life of the single, married, widowed, or divorced?

The expectation of life can be computed only for a group whose identity remains essentially unchanged during its lifetime. Thus, there is no difficulty in computing the expectation of life for native white females, since they will necessarily be so classified at all times. However, the case is much different for single females, particularly at the young ages. Most of them will eventually marry and, as a group, experience the mortality of the married. Furthermore, many of the married will later become either widowed or divorced, and so fall into a category with still another mortality experience.[3]

29. Do college athletes and college graduates in general live longer than other persons?

A study of men graduating from college from 1870 to 1905, showed that their expectation of life at the age of 22 was five years above that of white males of the same age in the general population. The record of college athletes was little different from that of other college graduates, but honor men had a two-year advantage over other college graduates in expectation of life at age 22. College attendance is so much more common today than 50 to 80 years ago that the differences between the college and noncollege groups have probably been greatly reduced. But the same general ranking may still persist, with college honor men living the longest on the average, and college athletes and other graduates doing better than those not attending college.

30. How does the longevity of clergymen, teachers, physicians, and lawyers compare with that of the general public?

Clergymen, teachers, and lawyers are favored with a low mortality and, therefore, a longevity better than average. In a survey in England and Wales, it was observed that at the age of 25 clergymen had an expectation of life five years greater than that of the general male population of the same age. Physicians, on the other hand, have had little advantage in longevity. Records of American doctors for the period 1938–42 showed that at age 25 the expectation of life for male physicians was the same as for the general male population, and women physicians aged 25 had only a very small advantage over women generally. Physicians had a mortality below average from infectious diseases and surgical difficulties, but a higher mortality from the degenerative conditions. Apparently, the advantages of medical knowledge and of a good social standing that doctors enjoy are not sufficient to offset the toll taken by the strenuous labors usual in their profession.[4]

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[3] See answer to Question 17 of Chapter VII, page 100.

31. Has there been any change in the longevity of Presidents of the United States?

The Presidents who were inaugurated before 1850 outlived the expectation of life they had at the time of taking office by an average of 2.9 years. Those inaugurated between 1850 and 1900 failed to reach their expectation of life by about 2.9 years on the average. Those who have served during the present century have averaged eight years less than was to be expected when they took office. An outstanding exception has been ex-President Herbert Hoover, who is still active in public life. There is no conclusive evidence that the increasing burden of office is taking a greater toll from our chief executives. The many years most of the more recent Presidents spent in public life before taking the country's highest office may have affected their longevity. On the other hand, it is perhaps significant that defeated candidates for the Presidency have lived longer on the average than those who won the elections. (See Chart 21 on page 402.)

32. Is longevity inherited?

There have been a number of studies indicating that longevity may be affected by constitutional inheritance. Environment, however, has a greater influence on length of life than inheritance. The gains in average length of life as a result of the improvements in the standard of living and the advances in the medical sciences have come to about 19 years since 1900. On the other hand, the studies on the inheritance

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[4] See answer to Question 26 of Chapter XVIII, page 282.

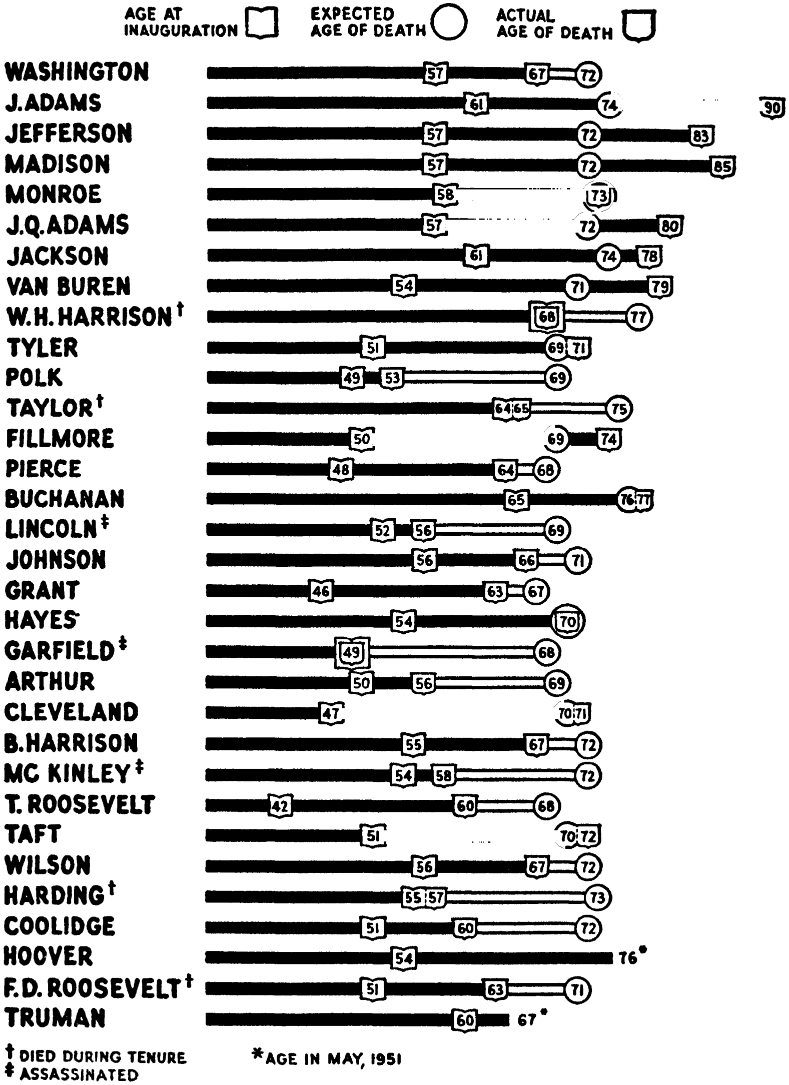

Chart 21. Longevity of presidents of the United States. Expected years of life after inauguration compared with the years actually lived.

of longevity show only a relatively small difference between those with long-lived parents and other groups. In other words, the extraneous factors in length of life greatly outweigh the influence of heredity.

33. How does the expectation of life of insurance policyholders compare with that of the general population?

The latest available data from the files of the Metropolitan Life Insurance Company indicate that at age 20 male policyholders of Ordinary insurance had an expectation of life about two and one-half years more than white males in the general population of the United States. On the other hand, at age 20 white male Industrial insurance policyholders (those insured for smaller amounts with weekly or monthly premiums) had an expectation of life one year less than the comparable figure for the general population.

34. Why are there differences between the longevity of life insurance policyholders and that of the general public?

Anyone who buys life insurance must pass either a medical examination by a doctor or a physical inspection by an insurance agent. The purpose of these is to weed out persons for whom the chances of early death are exceptionally high. Life insurance policyholders, therefore, are a select group in regard to health, and consequently also in regard to mortality. In addition, those who buy insurance for relatively large amounts and pay premiums on an annual or semiannual basis are likely to be professional or business persons. They have an advantage in longevity because of their better economic standing.[5]

35. Do persons with annuities live longer on the average than those who have life insurance?

Annuitants are distinguished from those who buy life insurance by several basic factors. A person who buys an annuity expects to live a long while. The man in obviously poor health would hardly make such a purchase. On the other hand, the purchaser of life insurance is interested in protecting his family against the possibility of his untimely death. If he believed he did not have long to live, he would probably be even more eager to buy insurance. Although there is unquestionably some overlapping between the two groups, the longevity experience of annuitants is generally above that of insured persons.

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[5] See answers to Questions 25 and 30 of this Chapter, pages 398 and 400.

36. What is a "generation" life table?

The usual life table, which has been referred to in the previous questions, is based on the experience of a community over a short period, seldom more than a decade; it is really a cross-section or snapshot table.[6] Such a table obviously introduces an unreal assumption, namely that the mortality conditions of a given period are continued for the lifetime of a generation. A "generation" life table, on the other hand, is one which is based on the experience of babies born

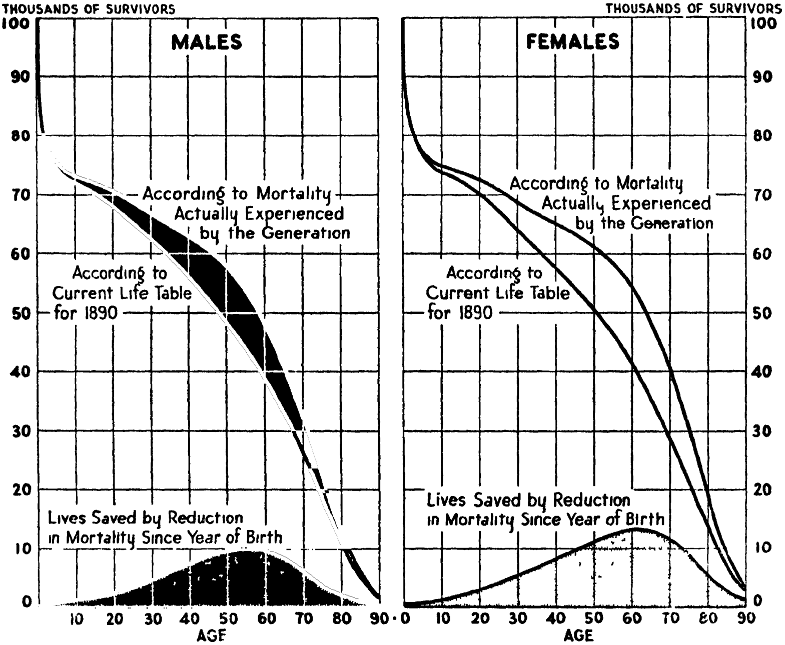

Chart 22. Survivors to successive ages, out of 100,000 born alive in Massachusetts in 1890, according to mortality: (a) actually experienced by the generation, and (b) prevailing in the year of birth.

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[6] See answer to Question 12 of this Chapter, page 392.

in the same year and followed by counting survivors at each birthday until the last has died. This type of life table takes account of the changing mortality conditions that a group of persons actually meets over the years. Unfortunately, the records are not available from which to compute a generation table. It would require more than a century of accurate data to follow a large group of individuals born during the same year until the death of the last survivor. However, it is possible to approximate a generation table from mortality data by an indirect method. Chart 22 shows, in the upper curves, the survivorship of the generation born in 1890 in Massachusetts. The lower curves show the survivorship predicted from a snapshot life table based on mortality conditions prevailing in 1890. The difference between the two sets of curves is shown in the shaded areas at the bottom and represents the lives saved because of the improvement in health conditions and mortality since 1890. This saving amounts to one-fifth of the men living at age 60 and a slightly higher proportion of the women at that age.

37. Do we outlive our expectation of life?

Since the usual life table reflects only the mortality situation of a single period and does not take into account the future improvements, it is safe to say that we outlive our expectation of life. For example, men born in 1890 will have an average length of life about 4.2 years longer than the expectation of life at the time of their birth; for women born in 1890 it will be about 5.8 years longer.

XXV

THE EFFECTS OF WAR

1. How many civilian lives were lost in World War II?

The loss of life among civilians in European countries may be conservatively estimated at 10 to 12 million, but estimates exceeding 20 million may be nearer the truth. Anything like accurate data are lacking for Eastern and Central Europe, which were chiefly affected. Russian losses are estimated at anywhere from 5 to 7 million. Estimates for Poland exceed 4½ million, and for Yugoslavia, nearly 1½ million. The greater part of civilian loss of life was due to high mortality in overrun areas and among workers, particularly Russians and Poles, sent to Germany. The civilian losses include an estimate as high as 6 million Jews exterminated by the Germans. Deaths due directly to air bombings and military operations are a relatively minor part of the total, perhaps no greater than 2 million. In China, also, the number of civilian deaths in World War II was large, but no reliable estimate can be made. Several millions died in India and Southeast Asia due to wartime shortages of rice and to failure of malaria control. In Japan, 400,000 to 500,000 deaths of civilians may be attributed to the war. A large part of this toll resulted from bombing of Japanese industrial centers. Small losses of civilian life were sustained in the Middle East and in North Africa.

2. How many lives were lost in combat among the armed forces in World War II?

It is estimated that the combat losses of all World War II belligerents were 9,500,000 to 10,000,000. Axis losses, estimated conservatively at 5,200,000, were appreciably greater than those of the Allies, whose battle toll was about 4,500,000. These figures exclude deaths among prisoners of war from Eastern Europe who were put into Germany's labor forces, and deaths among Germans who fell into Russian hands. Germany's military losses, estimated at 3,250,000, were the heaviest of any country in the war. Japan's losses were about 1,500,000. The estimate of Italian combat losses is 150,000 to 200,000, and for Germany's other satellites about 225,000. Russian losses, by far the heaviest among the allied nations, were estimated to have been about 3,000,000, or two-thirds of the total Allied losses in combat. The countries of the British Empire had battle losses of from 375,000 to 400,000, about three-fourths of them from Great Britain. The United States lost nearly 300,000 men on all fronts in World War II. Battle deaths of our other European Allies are estimated at nearly 450,000, excluding deaths incurred by the underground forces. French losses, including those of the Free French are officially estimated at 167,000. Poland's losses amounted to 125,000, including the deaths among Poles fighting with the Allies after the collapse of their country. Yugoslavia's military death toll was 75,000 and Greek losses about 50,000. China's military deaths after Pearl Harbor are conservatively estimated at 250,000.

3. How did the combat losses of World War II compare with those of World War I?

The total battle toll in World War II was appreciably greater than that in World War I. Death losses in the earlier conflict are not accurately known, but most of the estimates are of the order of 8,000,000. This is 1,500,000 to 2,000,000 less than the estimated number of 9,500,000 to 10,000,000 for World War II.

The comparative toll of the two World Wars differs greatly for most of the major belligerents. In some cases it is difficult to make accurate comparisons because the national territories were not identical in the two wars. American losses in World War II were about six times as high as in 1917–18. Both German and Russian losses in World War II were higher than in the earlier conflict. If allowance is made for differences resulting from boundary changes after World War I, the German figure is about 50 percent higher and the Russian figure twice as large in the last war as in World War I. Japan presents the most striking contrast, her losses in World War I amounting only to a few hundred, compared with 1,500,000 in the last war. British Empire losses in World War II were less than half those in the earlier conflict because of the radically different nature of the European phase of the two World Wars. French losses in the recent war were only about one-eighth those sustained in 1914–18, and Italy's about one-third those in the earlier war.

4. How many men served in the armed forces of the various belligerents in World War II?

Altogether 93,000,000 men and women served in the armed forces of the belligerent nations in World War II. The Allied nations mobilized more than 62,000,000, as against a total of 30,000,000 for the Axis countries. Of the Allies, Russian mobilization was the largest—22,000,000. The United States was next with 14,000,000. The British Empire called 12,000,000 into service, over half of which was furnished by the United Kingdom. On the Axis side, Germany mobilized 17,000,000 and Japan 7 to 8 million. In relation to the total population, the number mobilized by Russia and England was 13 percent; by the United States, 11 percent; Germany, including Austria, 21 percent; and Japan, 11 percent.

5. What were the losses in World War II in relation to the size of the armed forces and to the male population?

The total battle losses of all belligerents in World War II were about one-tenth of the total number mobilized for war service. The Allied losses were about 7.5 percent of the total; Axis losses came to about 17 percent or proportionately twice as heavy as for the Allies. The battle losses of the major belligerent nations, in relation to the size of their armed forces, were: on the Allied side, United States, 2 percent; Russia, 14 percent; British Empire as a whole, 3 percent; and the United Kingdom separately, 4 percent; on the Axis side, both Germany and Japan lost nearly one-fifth of their fighting forces.

In relation to the male population at the main productive ages, 15 to 64, Germany's losses were greatest. Based upon the prewar population of Germany and Austria, battle losses were more than one-eighth of all males in this age group. Our losses were 0.6 percent of the corresponding population; the United Kingdom, about 2 percent; Russia, about 6 percent; and Japan, about 7 percent.

6. How were military deaths distributed according to age?

Military deaths in wartime are heavily concentrated at the young adult ages. In the armed forces of the United States, about 95 percent of the deaths occurred among men under age 35. About half of all the deaths were among men between 20 and 24, and about one-fourth at ages 25 to 29. The average age at death was 25 but the peak numbers were at ages 21 and 22. Those killed in action were on the average 24 years old. World War II figures for other armies are not available.

7. What were our combat losses in World War II?

There were 297,000 men killed in action or died of wounds in all the armed forces of the United States. This figure includes men who died while prisoners of war. Army and Air Force fatalities were 239,000, or about 80 percent of the total. Of the remainder, 37,000 were Navy personnel, 20,000 Marines, and approximately 600 Coast Guardsmen.

8. What were the principal types of fatal combat injuries in World War II?

The types of combat fatalities varied greatly according to the place of action, and differed for the army and navy. Army statistics based upon the wounded men admitted to hospitals show that high explosive shells were responsible for more fatalities than any other agent in the European fighting, and that gunshot wounds accounted for most of the remainder. In the jungle fighting in the Pacific areas, gunshot wounds were the most frequent cause of combat fatalities. In the Navy, losses were particularly heavy from drowning and from burns.

9. How does the number wounded in World War II compare with earlier wars?

The total number of American fighting men wounded in World War II was about 700,000. This figure excludes those killed in action, but includes those who died subsequently. Army wounded account for nearly 85 percent of the total, the Marine Corps for 9 percent, and the Navy and Coast Guard for 6 percent.

The number of World War II wounded in all the services was nearly three times as high as the World War I total of about 235,000. Army wounded in World War II were more than 2.5 times the figure for World War I; for the Marines, 6 times as high; and for the Navy, more than 100 times as high. In fact, for the Navy and Marine Corps combined, the casualties in World War II were greater than in all our previous wars.

10. How did the fatality rate among our wounded in World War II compare with that in World War I?

The fatality rate among Army wounded in World War II was 4.4 percent, until then the lowest in history for any army in the world, and little more than half the rate of 8.3 percent in our army during World War I. For the Navy and Marines the contrast is even greater, with a fatality rate of 2.9 percent in World War II, compared with 12 percent in World War I. Among the United States forces in the Korean fighting in 1950–51, the fatality rate is only 2 percent.

11. How do deaths from disease and injury among the armed forces compare with the combat deaths in our wars?

In World War II, deaths from disease up to the end of 1945 totaled approximately 20,000, and deaths from noncombat injuries approximately 75,000, or a total of about 95,000 noncombat deaths. Thus, combat deaths exceeded those from disease and injury by more than three to one. For the Army this ratio is about 3.5 to 1, and for the Navy a little more than 2 to 1.

The ratio of combat to noncombat deaths in our armed forces in World War II contrasts greatly with our experience in earlier wars. Whereas in World War II this ratio was about three to one, the number of deaths in the two broad categories were about equal in World War I. In all earlier wars combat deaths were only a fraction of those due to injury and disease. In the Spanish American War, noncombat deaths were approximately 13 times those in combat, in the Civil War more than twice as many, and in the Mexican War, seven times as many.

12. What were the principal types of fatal noncombat injuries in World War II?

Air transport accidents accounted for nearly one-half of all fatal noncombat injuries from Pearl Harbor to the end of 1945. The next largest category was motor vehicle accidents, including training accidents in tanks, which were responsible for about one-sixth of the total. Water transport accidents and drownings accounted for about one-tenth of the fatal noncombat injuries, and accidents involving the use of firearms for about 7 percent.

Aviation accidents took a higher toll in the army than in the navy. About half the accidental deaths among army and air force personnel were due to this cause, as compared with about 40 percent in the navy and its auxiliary forces.

13. How many men were prisoners of war?

The total number of men taken prisoner in World War II may never be accurately known, but for all the belligerents it may have exceeded 15,000,000, not counting those involved in the final surrender of the armed forces of Germany, Japan, and their satellites. The Western Allies captured more than 4,500,000 enemy troops, all but about 50,000 of them in the European and Mediterranean fighting, and disarmed several million more when the Axis countries surrendered. The total captured by the Russians, which included large numbers of Hungarian and Rumanian troops, was probably of the order of 4,000,000 to 5,000,000.

Germany and her satellites suffered the greatest number of prisoner of war casualties, the losses being especially high in the fighting in Russia and in the final campaigns in Western Europe. Several hundred thousand Italians were Allied prisoners of war at one time.

The Germans took about five million prisoners. Not far from 1,500,000 Frenchmen were held as prisoners of war from 1940 until near the end of the war.

About 115,000 American soldiers and sailors were captured by the enemy, nearly 100,000 of them by the Germans. Of the British and Commonwealth forces, more than 300,000 were captured, the majority being men from the United Kingdom who were taken prisoner by the Germans.

14. How good was the health record of our armed forces during World War II?

The health record of our armed forces during World War II was remarkably good. The death rate from disease was the lowest in our military history, and in fact, lower than among men of the same ages in the civilian population. The leading causes of death from disease showed no substantial difference from those found in a civilian group of like age distribution, namely, diseases of the cardiovascular-renal system, tuberculosis, influenza and pneumonia, and cancer. Diseases which showed a significant excess mortality among service personnel were malaria, dysentery, beriberi, and scrub typhus. This is not surprising in view of the large numbers of men exposed to the hazards of war in tropical areas.

The chief nonfatal diseases were also similar in order of frequency to those which occurred among civilians, e.g., respiratory disorders, gastro-intestinal upsets, and the like. The only major diseases occurring with unusual frequency in the armed forces were malaria, hepatitis, rheumatic fever, and some of the communicable diseases common in childhood. In the Pacific and in the Asiatic theatres of the war, malaria was the leading cause of disability for a time. In one period of active combat there, it resulted in more than twice as many noneffectives as battle casualties.

15. How did the mortality from disease among the armed forces differ in the two World Wars?

The chief difference was with respect to influenza which was by far the leading cause of death in World War I. Altogether, of the approximately 50,000 deaths from disease in World War I, about two-thirds were accounted for by influenza and its complications. In contrast, no serious epidemic of this type occurred in World War II. Communicable diseases accounted for a high proportion of the total morbidity and mortality from disease in World War I. In fact, measles was the second leading cause of death from disease in 1917–18.

16. What were the chief medical advances in World War II?

Wartime needs stimulated the search for new drugs which would be effective against infectious organisms. This led to the use of the sulfa drugs on a wide scale and to speeding up the development of penicillin. The success with penicillin gave great impetus to research in antibiotics with the result that during and since the war many new products have been discovered and brought into use, notably streptomycin, aureomycin, chloromycetin, and terramycin. Other major advances, many of them representing results of wartime research, were made in the use of blood and blood derivatives. New knowledge was gained as to the most effective methods of treating shock due to blood loss. Another important fruit of this work is gamma globulin, which is now used widely in the prevention or modification of measles and scarlet fever.

In the field of preventive medicine, the most important new developments were an effective vaccine against typhus and active immunization against tetanus. The latter is now in wide general use, particularly in childhood immunization. Wartime provided large-scale demonstrations of the control of diseases transmitted by insects. Area spraying of DDT by airplanes to control typhus, malaria, and other diseases, and the general development of chemicals effective against insects and rodents, have provided new public health measures against a wide variety of diseases.

There were many gains in the field of psychiatry, the development of group methods of treatment being perhaps of greatest importance. Research in aviation medicine was important in the development of high altitude flying. Medical studies based upon atomic research have opened vast new fields in the investigation of disease and disease processes.

17. What new medical problems were met in World War II?

The chief new medical problems faced by our armed forces in World War II revolved around the protection of our fighting men against tropical diseases in the Pacific areas, North Africa, and the Middle East. The foremost problem was malaria control, and this was made the more acute because the major source of supply of quinine was cut off by the Japanese conquest of the East Indies. This difficulty was finally overcome by a combination of antimalarial measures—the spraying of places where the disease-bearing mosquitoes breed, and the use of new antimalarial drugs which had to be developed and manufactured on a large scale.

Typhus also was a potential threat to our soldiers. This disease proved to be controllable by the simple measure of delousing native populations and our servicemen with DDT. Other types of typhus or rickettsial diseases were encountered in the Pacific areas against which the chief measures were protective clothing. The threat of yellow fever among our men stationed in some tropical countries was met by development of an effective vaccine.

18. What was the venereal disease record in our armed forces during World War II?

The army and the navy, working closely with civilian leaders, accomplished a great deal in controlling venereal disease. As a result, the average rate for all such diseases, from Pearl Harbor to the end of military operations in 1945, was less than one-half the figure for World War I. For syphilis, which accounts for a minor part of the total, the record was even better. Thus, in the army the admission rate for all venereal diseases from 1942 to 1945 was about 43 per 1,000 per year, against 95 in World War I. The admission rate for syphilis was 6 in the last war, compared with 17 in 1917–18. The figures for the navy were lower than for the army. The use of penicillin worked a revolution in the treatment of the venereal diseases in World War II.

19. What is the size of our veteran population of various wars?

The number of veterans living as of mid-1950 is approximately 19,076,000. The figure includes men still in the armed forces who fought in the last war. Of the total, 15,386,000 are officially classified as veterans of World War II, and more than 3,500,000 of World War I. Veterans of the Spanish American War still living number about 100,000. The remaining veterans are the few hundred survivors of the Indian Wars and less than 10 survivors of the Union forces of the Civil War.

20. How much is being paid out to veterans in compensation payments because of war connected disability, and how many are receiving them?

Nearly 2,000,000 American veterans are receiving compensation payments for service connected disability; these payments exceed $1,000,000,000 a year. World War II veterans, who account for nearly 1,650,000 of the total, are receiving nearly $900,000,000 a year. The remainder consists almost entirely of payments to World War I veterans. The great majority have disabilities of relatively limited extent. However, nearly 75,000 World War II veterans were receiving service-connected total disability payments.

The foregoing figures relate to June 30, 1950. They keep changing because of deaths of veterans and redetermination of eligibility for compensation. The number receiving disability is on the decline, but the amounts are not because of the liberalization of benefits to some classes of veterans.

In addition to the amounts paid to living veterans, substantial sums are paid to dependents of deceased veterans. Such payments are being made in behalf of more than 300,000 deceased veterans who were killed or died as a result of war service. The payments to these dependents as of mid-1950 were nearly $300,000,000 a year.

21. What military casualties have been sustained in the war in Korea?

Up to August 3, 1951, American casualties numbered 80,430. This count, based upon reports to next of kin and still incomplete, includes 11,954 killed in action, 56,215 wounded, and 12,261 originally reported missing. Known deaths among these wounded and missing bring the battle death toll to 13,433. Subsequent reports on the missing reduce their total to 10,633. Our losses in Korea exceed those in all our previous wars except the Civil War and the two World Wars. Reported battle losses of the South Korean forces through June 20, 1951, were about 165,000, including 21,625 dead. Those of the other United Nations countries have been small. Communist losses have been estimated at nearly 1,250,000.

22. What was the loss of life in the merchant marine of the various belligerents in World War II?

Losses of life among merchant seamen in World War II exceeded 50,000 for the Western Allies and the neutral countries of Western Europe. Figures for Russia, Germany, and Italy are not known, but they are probably relatively small. Russia's allies furnished most of the ships in which supplies were sent to that country.

Nearly 6,150 members of the U. S. Merchant Marine were reported killed or missing in World War II. This is nearly nine times the death toll in World War I. As in World War I, British losses were by far the heaviest, totalling over 35,400 men or about two and one-half times that for World War I. The figures include seamen of other nationalities serving on British ships. The Japanese losses of about 27,000 seamen in World War II were second only to those of the British.

23. What was the loss of life from bombing among civilians in various countries during World War II?

The civilian death toll from bombing in World War II will never be accurately known, but probably reached 1,200,000 and perhaps 1,500,000. At least two-thirds of the victims were nationals of the Axis countries. About one-half million German civilians were bombing victims, according to the careful estimates made by the United States Strategic Bombing Survey. The Japanese toll, estimated by the survey, was 360,000 to 375,000. About one-third of this total was accounted for by the two atomic bombs dropped upon Nagasaki and Hiroshima. England's civilian deaths from air bombing exceeded 60,000, and those of France were reported to be 54,000. Civilian deaths from air raids in Eastern and Southern Europe are estimated to exceed 100,000, about half of which were sustained by the Poles. The Russian losses are unknown, but probably were severer than those sustained by the English.

24. What were the major types of injury resulting from atomic bombings of Japan and what after effects were suffered by the victims?

Burns accounted for more than 50 percent of the fatal casualties from the atomic bomb. Most of these fatal burns resulted from fires caused by the bomb but many resulted from thermal radiation due to the intense heat it generated. The remaining fatalities were in large measure due to blast injuries, either directly from the force of the explosion or indirectly as a result of the collapse of buildings. Thus, in general the principal causes of fatal injuries from the atomic bomb were no different in character from those caused by conventional bombs.

The types of casualties peculiar to the atomic bomb were those due to nuclear radiation. The immediate prognosis was related to the degree of exposure. Such fatalities are estimated to represent 15 to 20 percent of the total number. Death in these cases was for the most part delayed—from hours to weeks after the bombing.

The long-term aftereffects of nuclear radiation among the survivors are not yet known. Radiation exercises some influence on gene mutation but at least a generation must elapse in order to accumulate data which will permit the accurate evaluation of the extent of these effects of the atomic bomb. This matter is now the subject of intensive long-range investigations.

25. What was the health record of the United States during World War II?

The health of the American people was maintained at an extraordinarily high level during the war. The country was free from any severe epidemic during the entire war period. Moreover, intensive efforts were made to use our medical resources efficiently, and the food rationing program and other measures helped to bring improvement in the general nutrition of the population. The use of new medical discoveries and particularly the availability of new drugs also helped in the control of disease. As a result, the death rate, exclusive of mortality from enemy action, declined during the war. The rate in the entire period 1941 to 1945, was about 15 percent less than in the preceding five-year period. Mortality was lower in every age group, with reductions particularly large at the childhood ages. New low death rates were recorded during the war for tuberculosis, respiratory diseases, and childhood diseases, and for infant and maternal mortality.

The situation in World War II was very different from that in World War I, the closing year of which was marked by an influenza epidemic of great severity, causing an increase of nearly 30 percent in the overall death rate in 1918 as compared with 1917.

26. What was the course of the death rate in European countries during the war?

Wartime mortality in Europe varied widely from country to country. England's record, like our own, was exceptionally good, except in 1940 when there was a severe influenza epidemic. England developed a very high degree of efficiency in her health services during the war and successfully overcame the health problems incident to the large scale evacuation of metropolitan areas, the air bombing of cities, shortages of food, and the accelerated production of war materials. The health of the German people was at first maintained at a high level, largely because the country had prepared for war and seized the food and other resources of occupied countries. But when the tide of war turned against her, there was a rapid deterioration in health conditions in that country. Death rates elsewhere in continental Europe rose during the war. Except for Denmark, the rise was particularly marked in countries occupied by the Germans. Unfortunately, reliable figures are not available for most of the countries, and none at all for Eastern Europe. Compared with the prewar figures, the death rate in France in 1944 showed an increase of 30 percent; that of The Netherlands in 1945, an increase of 75 percent; and that of Belgium in 1944, an increase of 20 percent. In many countries there was a sharp increase in the mortality from tuberculosis and in infant mortality.

27. What major outbreaks of disease developed during both World Wars?

The situation with regard to epidemic diseases was much better in World War II than in World War I. In the earlier conflict there were large scale outbreaks of typhus fever in Eastern Europe, but this disease was kept under good control, even in most parts of Eastern Europe, during the last war. The great epidemic of influenza in 1918 engulfed all the European continent as well as other regions. The total loss of life throughout the world resulting from that epidemic is estimated to exceed 20,000,000.[1]

Although influenza struck parts of Europe in two of the recent war years, it was not very severe, and the number of deaths was relatively small. Perhaps the worst outbreak of epidemic disease in Europe in World War II was a severe and fatal form of diphtheria. Altogether about 2,000,000 people in Western Europe were struck by this disease, and the number of deaths was estimated at about 250,000. The greatest death toll from disease indirectly related to the war was that from malaria in India and Southeastern Asia. With the major source of supplies of quinine cut off, the disease raged uncontrolled in many areas, and deaths from malaria increased by more than a million a year over the peacetime level.

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[1] See answer to Question 24 of Chapter XI, page 168.

28. What in general has been the effect of war on pandemic disease?

Pandemic diseases frequently have been associated with wars, in some cases occurring during the war period and in others immediately following. Up to modern times the disease responsible for pandemics following wars often could not be identified, but plague and typhus are believed to have been the chief offenders. In the fifteenth century, syphilis also took on the proportions of a pandemic in many parts of Europe. Typhus fever was one of the causes of the collapse of Napoleon's army in his invasion of Russia. The returning soldiers caused widespread and devastating outbreaks of the disease, particularly in Germany. As a result of the outbreak of typhus that swept Serbia in 1914, the Austrian army stopped active military operations for about six months, and this circumstance may have been a factor in the ultimate outcome of the first World War.

Perhaps the most striking modern example of war-borne disease is the great influenza pandemic of 1918–19, which swept over a great part of the world. Otherwise, the most serious pandemics resulting from the war were those which swept Eastern Europe, and especially Russia, during World War I and the revolution. In Russia alone it is estimated that 20 to 25 million persons fell ill with typhus, and three million died. The incidence of cholera and typhus was high, and syphilis was rampant. Altogether, possibly eight to ten million persons died in Russia from pandemic diseases between 1916 and 1923.

In comparison with World War I, the incidence of pandemic disease in World War II was light and for the most part affected relatively circumscribed areas.

29. Are the death rates from accidents, suicide, and homicide affected by war?

The major effects of war on the accident rate in this country result from the expansion of production and the entry of inexperienced workers into factories. In World War II, however, this was offset by a drastic reduction in the mortality from motor vehicle accidents as a result of restrictions on driving. In countries which were subject to blackouts during the war, there was an increase in accidents due to this cause.

Suicide rates are profoundly affected by war. It has been the experience in all countries that the rate from this cause is markedly reduced during wartime, largely because people are less occupied with their own personal problems. Another factor is the improved economic conditions resulting from the expanded production of military goods. Homicide likewise declines in wartime, but generally the fluctuations are not as great as for suicide.

30. How was the marriage rate in the United States affected by World War II? [2]

31. What was the wartime trend of marriage in other countries?

The marriage rate in Germany rose sharply in 1939 but then fell even more rapidly in 1940. A further decline occurred in the middle war years. The marriage rate in England showed a large increase in 1939 and again in 1940. Although the rate fell in the middle war years, only in 1943 and 1944 was it below the pre-1939 level. The postwar rise was relatively small. The rate in both France and Belgium declined sharply in 1940, soon recovered, but then fell again during the period of active military operations there in 1944–45. Both countries showed a sharp postwar increase in marriage.

32. What was the effect of the two World Wars on the birth rate in the United States? [3]

33. What effect has war had on the birth rate in other countries?

In all the belligerent countries of Europe, birth rates showed a sharp decline during World War I. The severity of the decline was in almost direct proportion to the degree to which normal life was disrupted in the various countries, being least in England. For the entire period of World War I, birth deficits for the various countries have been estimated as follows: 599,000 for England, 1,686,000 for France, 311,000 for Belgium, 1,426,000 for Italy, and 3,158,000 for Germany. In all the countries of Central and Western Europe there was a sharp but temporary recovery in the birth rate after the war.

While the general course of the birth rate in Europe during World

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[2] See answer to Question 21 of Chapter III, page 39.

[3] See answer to Question 26 of Chapter II, page 23.

War II was similar, there were striking variations due to the differing train of events in the two wars. In England, where most of the men remained within the country for the greater part of World War II, the birth rate declined slightly in the early years. The rate then increased so sharply that from 1942 forward it was above the prewar level; in 1944 it was actually at the highest point since the early 1920's. The birth rate in Germany fell in the early war years; in the late war years, the reduction was very sharp, but there has been some recovery since.

The French birth rate, which was extremely low before the war, showed a moderate decrease in the early war years, but thereafter rose above the prewar level. The postwar level has been higher than at any time in a generation. Italy's birth rate fell continuously during the war period.

34. What was the effect of the World Wars on the population of the belligerents?

Lack of census data since World War II and the continued unsettlement of great parts of the world make it impossible to measure over-all population losses due to the war, but they were exceptionally heavy in Eastern Europe. Poland's net loss, for example, was approximately 9,000,000, and Yugoslavia's in the neighborhood of 1,000,000. France suffered a population loss of approximately 1,500,000. Losses for Russia and Germany are of unknown extent. Russia's loss was perhaps as large as Poland's, the major part being due to the high mortality in the large area of Western Russia that was overrun by the Germans. It is likely that Germany suffered a net loss of population, but of moderate extent.

The population of many countries declined in World War I also. For France, deaths, including military losses, exceeded births by approximately 2,800,000, or about 7 percent of her 1914 population. For Germany this loss was about 1,400,000, or 2 percent of the 1914 population; and for Italy, about 1,200,000, or 3.5 percent of her prewar population. Russia's losses were large, but difficult to estimate. If the entire period covering World War I and the revolution is taken, the net loss of population was probably in excess of 10,000,000.

35. What have been the major migratory movements during and since World War II in Europe?

How many people in Europe were uprooted during World War II will never be known accurately, but a published estimate of 30 million does not appear unreasonable. The greatest migratory movement resulted from Germany's importation of possibly 10 million workers to man her factories and farms, and to build her western defenses. The most tragic of these forced population movements was the uprooting and later extermination of the major part of the Jewish population of Europe. Another major population movement resulted from the shift of millions of Russian factory workers to areas safe from German attack.

Extensive movements of Europe's population occurred early in the war as the result of the arranged exchanges of population. On the basis of Germany's agreements with Russia, Italy, and Rumania, more than 500,000 Germans moved from the Tyrol, the Soviet occupied areas of Poland, and Rumania. Another 400,000 Germans were shifted to the part of Poland which Germany took over in 1939. The settlement imposed by Germany on Poland brought the deportation of many Polish citizens from their homes. When the German armies approached the Volga region, Russia moved the 400,000 persons of German ethnic origin living in that area. After Yugoslavia's liberation, approximately 100,000 Germans were forced out of that country. Elsewhere in Europe, agreements between Finland and Russia involved the resettlement of nearly a million persons, and an even greater number of persons were involved in the various exchanges of population between countries in Southeastern Europe.

Extensive postwar shifts of population, chiefly of Germans from border states, resulted from agreements among the Allies at the war's end. Altogether, postwar migration, apart from the repatriation of displaced persons, is estimated to exceed 10,000,000.

Most of the wartime displaced persons were returned to their homes; others settled elsewhere. The new State of Israel now has approximately a million inhabitants, a major part of whom have come to the country from Europe since 1939. The United States, Canada, Great Britain, Argentina, and Brazil have been the chief places of settlement of displaced persons who did not want to be repatriated. The United States has accepted 250,000 such people up to July 1951.

36. What major wartime shifts took place in the population of the United States?

Demands for war production caused a considerable internal migration in this country. The chief sources of these migrants were the rural areas in the Middle West and South, but there was also a sizable migration from cities in various parts of the country to the main centers of war production. The West Coast states, whose population increased more than 50 percent in the last ten years, received the largest number of migrants. Other areas which showed large population gains during the war were the Southwest, particularly Texas, and the industrial belt in the Middle West. Most of this wartime migration has been permanent.

37. How many children were orphaned in both World Wars?

For World War I it is estimated that the total number of orphans was of the order of nine million. Of these, about two million were in Poland, one and one-half million in Germany, nearly one million in France, and one-half million in Italy. The actual number of war orphans must have been considerably larger if those with parents killed in postwar disturbances are included. The number in Russia was huge, and as late as 1928 the surviving "wild" children of Russia were estimated at nine million.

No reliable estimate of World War II orphans has appeared, but it is likely that their number is of the same order as World War I. For the United States, about 120,000 children were orphaned by the death of the father in service during World War II.

38. What was the trend of juvenile delinquency during World War II?

Selected figures on police arrests and on cases disposed of by juvenile courts showed a sharp rise during the war, but there was a relatively quick reversion toward prewar levels in 1946 and 1947.

The wartime increase in juvenile delinquency was greater for girls than for boys. This difference was due in large part to the significant increase in the number of late teen-age girls arrested or referred to juvenile courts for sex delinquency. For both boys and girls the rise in delinquency may be attributed chiefly to wartime disruption of home and family life by the absence of the breadwinner, or by the employment of mothers. Difficulties arose, too, because many teenage boys and girls were earning more money than they knew how to use wisely.

39. How much has World War II already cost this country?

Estimates of the cost of World War II to this country vary according to the basis used. A conservative estimate is approximately $410,000,000,000. This figure covers direct war costs, including the excess of military expenditures over prewar figures, war shipping, emergency housing construction, the increased amount of interest paid on the national debt, and the cost of veterans' benefits up to the present. It would be justifiable to add to this estimate the amounts spent to rehabilitate Europe through the Economic Cooperation Administration. These expenditures, to the end of the fiscal year, 1950, amounted to $8,316,000,000, and before the expected termination of the program will exceed $10,000,000,000.

The over-all estimate does not include the cost of the "cold war" nor the amount spent since the end of the war on the manufacture of atomic bombs and the development of new atomic and other weapons. It likewise does not include the capitalized money value of the men killed or disabled in service, nor the loss of civilian production.

SELECTED REFERENCES

Many sources were used in preparing this volume, but because of space limitations it is not possible to list all of them. Grateful acknowledgment is made here to all authors whose works were consulted, whether or not specifically named.

The references presented below were selected for readers who wish to pursue further the various topics covered. Many of the sources mentioned will, in turn, refer to more specialized works. The list begins with a few general references which bear on the subject matter of most chapters, as well as a list of sources of current information. These are followed by specific references to the questions covered in the individual chapters.

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